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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

CHADWICK LECTURES on the History of Epidemiology during the last Hundred Years. By Sir WILLIAM HEATON HAMER, F.R.C.P.—Lecture II. .. 1

ORIGINAL ARTICLES.

The Intensive Serum Treatment of Severe Diphtheria. By H. STANLEY BANKS, M.B., D.P.H., AND GEORGE MCCRACKEN, L.R.C.P.—(*Illustrated*) .. 4

Inflammations and Fistulæ of the Salivary Glands and their Treatment. By CECIL P. G. WAKELEY, F.R.C.S.—(*Illustrated*) .. 7

The Rheumatic Lung. By A. E. NAISH, F.R.C.P.—(*With Coloured Plates*) .. 10

CLINICAL AND LABORATORY NOTES.

A New Method of Administering Heavy Metals, with Reference to the Treatment of Cancer. By J. LEON JONA, M.D. 15

An Unusual Case of Acute Intestinal Obstruction. By JAMES FANSTONE, M.D., and GERALD GOLDEN, M.B. 15

A Note on Multiple Superficial Ulcers of the Small Intestine. By K. KANAGARAYER, L.M.S..... 16

REVIEWS AND NOTICES OF BOOKS.

Simple Goitres. By R. McCarrison, F.R.C.P. .. 17

The Species Problem. By G. C. Robson 17

Internal Secretions and Metabolism in Infancy and Childhood. By Prof. Fritz B. Talbot, M.D..... 17

Hormone und Inner Sekretion. By Dr. Fritz Laquer 17

The Great Problem and the Evidence for its Solution. By George Lindsay Johnson, F.R.C.S. 18

Clinical Diagnosis by Laboratory Methods. By Prof. James Campbell Todd, M.D., and Prof. Arthur Hawley Sanford, M.D. .. 18

Mikromethodik. By Ludwig Pincussen 18

Metanthropos, or the Body of the Future. By Ronald Campbell Macfie, M.B. .. 18

Pathological Physiology of Internal Diseases: Functional Pathology. By A. W. Hewlett, M.D. ... 19

Précis de Physiologie. By Prof. Maurice Arthus.... 19

The Principles of Infant Nutrition. By K. H. Tallerman, M.D., and C. K. J. Hamilton, M.R.C.P. 19

A Symposium of Culture. By Prof. G. Elliot Smith, D.Sc., and others 19

The Alchemy of Light and Colour. By Oliver L. Reiser 19

Intelligence and Mental Growth. By Claude A. Claremont, B.Sc..... 19

The Standardisation of Error. By Vilhjmur Stefansson, M.A..... 19

Medical and Allied Topics in Latin Poetry. By Henrich Oppenheimer, M.R.C.P. 20

Acta Paediatrica 20

LEADING ARTICLES.

LOCAL GOVERNMENT REFORM 21

THE CONTROL OF DIPHTHERIA 21

CONCURRENT EVOLUTION .. 22

ANNOTATIONS.

Testamentary Capacity.... 23

Beri-beri on Different Diets 24

Syphilis Refractory to Treatment 24

The Cause of Sudden Death in Criminal Abortion 25

Fractures Set by Machinery 25

Permanent Enlargement of a Contracted Pelvis..... 25

Cardiac Pain in Rheumatic Fever 26

The Provision of Glasses for Very Fine Work 26

The Sheffield Medical School 26

A Dinner to Sir Robert Jones..... 27

International Standardisation of Digitalis and Ergot 27

THE SERVICES.

Royal Naval Medical Service.—Royal Army Medical Corps.—Royal Air Force.—Indian Medical Service 28

MODERN TECHNIQUE IN TREATMENT.

CCLXXXIII.—The Surgical Treatment of Chronic Infections of the Seminal Vesicles. By FRANK KIDD, M.Chir. 28

SPECIAL ARTICLES.

Deaths and Death-rates in the Merchant Marine, 1926. By Fleet-Surgeon W. E. HOME..... 30

Smooth and Rough Strains of Bacteria 31

The Dairy Congress: Rôle of the Veterinary Surgeon in the Improvement of the Milk-supply 32

League of Nations: An Inquiry into the Radiotherapy of Cancer 34

Presentation to Mr. White Wallis 29

PUBLIC HEALTH SERVICES.

Reports of Medical Officers of Health: Wiltshire, Sunderland, Edmonton, Doncaster, Ramsgate, Yeovil 35

School Medical Service: Shrewsbury, Bootle, Taunton 37

Infectious Disease in England and Wales 37

CORRESPONDENCE.

The Early Diagnosis of Cancer of the Colon and Rectum (Dr. T. Vincent Dickinson) 38

A Simple Hookworm Larvicide (Lieut.-Colonel C. A. Gill) 38

Pericardial Knock (Dr. H. E. Symes-Thompson) 38

Varicose Ulceration: Ultraviolet Light and Unna's Paste Dressings (Dr. Dora C. Colebrook) 39

Removal of the Right Cerebral Hemisphere in Man (Sir James Dundas-Grant) 39

Acute Aplastic Anæmia (Dr. A. Hayes Smith) 40

Encephalo-Myelitis following Vaccination (Drs. Donald Hunter and W. Russell Brain) 40

OBITUARY.

Edgar March Crookshank, M.B. 41

Henry Handford, F.R.C.P. 41

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics: Duty on Scientific Films.. 42

House of Lords: Dogs Act (Amendment) Bill 42

House of Commons: Smallpox in England and Wales. Health Insurance Benefits and Outdoor Relief.—Silicosis and Workmen's Compensation.—Welsh Board of Health.—Biochemical Research.—The Rating of Voluntary Hospitals.—Medical Services in Scotland 42

MEDICAL NEWS.

University of Oxford 44

University of Birmingham.. 44

University of Durham 44

University of Sheffield 44

University of Glasgow 44

University of St. Andrews.. 44

University of Dublin 44

Paying Patients at Newcastle-on-Tyne 6

St. John's Hospital for Diseases of the Skin..... 6

Donations and Bequests.... 16

American Beds at the Royal Free Hospital 29

Glasgow Hospitals 40

The Asthma Research Council 43

Hunterian Society 44

Epsom College: Annual General Meeting of Governors..... 44

British Pathologists Association 44

London Hospital Prize-giving 44

Carlisle Fever Hospital 45

NOTES, COMMENTS, AND ABSTRACTS.

Helpers in Hygiene. By ANDREW BALFOUR, M.D. 46

Assessment of Rates on Hospital Buildings 50

A Brutal Schoolmaster 50

Hospitals for Middle Classes: An Appeal 50

Medical Diary 45

Appointments 45

Vacancies 45

Births, Marriages, Deaths .. 46

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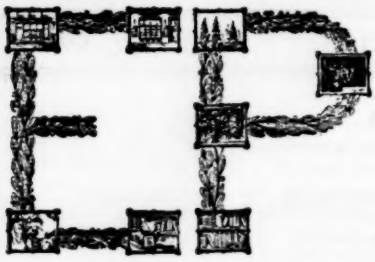

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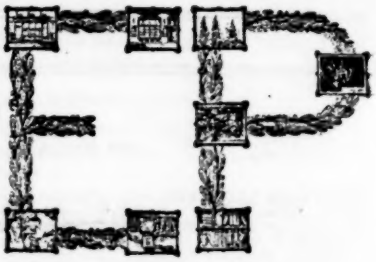

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LECTURE II.

THE sage, Koheleth, "the Preacher," who lived more than 2000 years ago, said there was "no new thing under the sun." The thought is that of the "Persistence in Change" (Dauer im Wechsel) of Goethe, who elsewhere says "Everything that is wise has been thought already; we can only try to think it once more."

Some have surmised that Koheleth was a physician, and certain passages in the book of Ecclesiastes support this view, and have been said to foreshadow the first Aphorism of Hippocrates, or even Sydenham's doctrine that "Epidemics succeed each other regularly and in series forming as it were a circle." A verse much commented upon runs: "He hath made every thing beautiful in his time; also he hath set the world in their heart, so that no man can find out the work that God maketh from the beginning to the end." It is said that the word translated "world" should be rendered "eternity" (or "history"), and such renderings prompt the suggestion that Koheleth was a bit of an epidemiologist; he would then have realised the limitations of his own "little patch of immediacy," and have proceeded as Prof. Whitehead says we must do, to apply the experience gleaned from that patch to the teaching of bygone times.

Be this as it may, the history of epidemiology is replete with illustrations of such lines of thought.

Thus it has been suggested that one of the most characteristic marks of pandemic influenza is that it is generally acclaimed by mankind as a "new disease," and then, as Dr. Goodall says, and there is no greater living authority on such a point, "there is no such thing as a new infectious disease." The occurrences of 1915–25 almost seem to justify the application to influenza of Alphonse Karr's phrase, "Plus ça change, plus c'est la même chose," and to support Hirsch's somewhat paradoxical declaration that "Influenza, beyond all other acute infective diseases, has manifested at all times and in all places the stamp of uniformity in the aggregate of symptoms." Dr. Charles Creighton's History prompts similar lines of inquiry. The accounts of the "Sweating Sickness," of "Gaol Fevers, Influenzas and other Fevers of the Tudor Period," the great chapters on "Typhus and other Continued Fevers" and "Fevers and Dysentery in Ireland," leading up to "Influenza and Epidemic Agues," in which we are told "Epidemic Agues are joined in the same Chapter with Influenzas for the reason that they can hardly be separated from them in the earlier part of the history," this stirring argument was set out by an historian steeped in the medical learning of the earlier centuries, familiar with the life-work of Sydenham, Willis, and their contemporaries, and with that of the school founded by them, and was critically and appreciatively expounded in relation with the "influenzas," which had appeared under that name, upon the stage of history during subsequent years. Creighton's facts and speculations stirred the minds of his readers between 1894 and 1915, and made them more apt to receive the impressions hammered upon them during the then succeeding years.

Already in the early 'nineties Franklin Parsons laid stress upon the types (pulmonary, cerebro-spinal, and gastro-intestinal) of influenzal prevalences. Moreover, Leichtenstern urged then that "Influenza presents at least two phases, one pandemic and the other endemic, and they follow different epidemiologic rules"; he further expressed two beliefs—first, that "trailing epidemics show diminished morbidity, less wide geographical distribution, scarcely recognisable communicability, slow development and extension, and continuous diminution in frequency and intensity": and, second, that "in the later epidemics the *vis morbi* became more pronounced with the decrease of the *vis contagii*, owing perhaps to weakened influenza germs entering into closer symbiosis with other pathogenic organisms."

Again, Dr. Goodhart declared in the middle of the 'nineties "influenza is still with us," and it was becoming recognised that in family attacks of influenza the disease was apt to be quite differently manifested in the several sufferers, and, if this was accepted as regarded households, why, it was being asked, was it not credible as regards communities also?

In East Herts, in 1904–5, Dunn and Gordon described their "obscure disease simulating influenza"; then came the cerebro-spinal fevers of Glasgow and Belfast, the polio-myelitis reported upon by Brorström in Sweden and by Farrar and Reece in this country, and that of New York in 1916. In London Shirley Murphy more than 20 years ago secured the notification of cerebro-spinal fever and soon afterwards of poliomyelitis and polio-encephalitis, and borough medical officers made careful study of each case notified. As early as Jan. 26th, 1912, it was possible to assure Dr. Reece that cerebro-spinal fever and poliomyelitis were distinguishable, one from the other, by reason of the fact that the record of the former appeared on blue forms and that of the latter on white forms. In the London Annual Reports for 1914–17 account of the behaviour of these two epidemic diseases was given, and in 1915 study of the close relationship between cerebro-spinal fever and influenza in London was made.

Then came the prevalences of 1918, and early in that year it was apparent that "The events of the last few months once more strikingly illustrate the 'posting character,' the unexpected manifestations and the protean behaviour of 'influenza'; and, incidentally, the close connexion between polio-encephalitis (i.e., what has since been called encephalitis lethargica), poliomyelitis and cerebro-spinal meningitis, and influenza, seems to be established." (Annual Report for 1917, p. 2.)

In the Ministry of Health Report of 1920 Sir George Newman gave (p. 16) an account of "our growing experience of the setting of an influenza epidemic"; and the same report sets out in detail the experiences of John Huxham between 1728 and 1752, and presents a summary record (p. 17 and onwards) of similar phenomena collected by various observers, from Sydenham's time down to 1847.

Study of the epidemiological record, then, makes it clear that, so far as the influenzal group of diseases is concerned, the natural history method, the method of Hippocrates, is that which must primarily be relied upon.

Dr. Adams tells us that it is very difficult to assign the cases described in the first book of the Epidemics of Hippocrates to their appropriate disease categories. The reason, he says, is that they are "directly drawn from Nature." Sydenham followed this method, and Dr. Payne not many years ago remarked that it is sometimes impossible to decide as to the nature of the prevalences he is discussing. Nowadays we are very prone to think in terms of "causal organisms" (as we used to call them; they are really many of them just "associated organisms"), whereas Sydenham and his followers unravelled the relationships between *associated prevalences of epidemic diseases*, and we are beginning to realise that it behoves us, too, to think in epidemics as well as in micro-organisms.

The outcome of all this may be best appreciated by focusing attention upon Sydenham's treatment of the difficulties with regard to influenza; but it must be a reversion to Sydenham's matured views, not merely to the tentative and, as would now appear, somewhat prematurely conceived doctrines enunciated in those wonderful opening chapters of his Medical Observations.

This first draft, so to speak, underwent in Sydenham's own mind a considerable amount of revision; the original sketch was, however, incorporated in a revised edition in 1675, and, achieving in this form, as it soon did, a world-wide reputation, has not unnaturally been commonly regarded as representing his final view; examination of the development of the conceptions revealed in the writings of the older Sydenham will, however, show that this was very far from being the case. Already in 1675 (Med. Obs. V., vi., 6) it appears he was beginning to concern himself with what now seems a somewhat meticulous enumeration of differentiæ between the "stationary fevers" of his earlier constitutions, and, even at that date (V., v., 1–3, and V., vi., 1–2) he noted the resemblance of his first stationary fever to the fever of the winter of 1675, to which, and to the successors of which, he makes fuller reference in the letter to Dr. Brady of 1680 (paras. 54–57). He speaks of it as the "depuratory fever," the "standard fever of Nature," the "fever upon which Hippocrates and other great physicians of antiquity have commented."

One never need feel surprise at coming across some new light in studying Sydenham, and it is not to be wondered at, therefore, that a pearl of great price is to be found hidden in what is at first sight a somewhat unpromising Postscript to his "Tractate on Dropsy"

* Being two lectures delivered in London under the Chadwick Trust on Feb. 16th and 23rd, 1928. Lecture I. appeared in THE LANCET last week.

written in 1683; here, after two and a half centuries, we can still glimpse one of his flashes of inspiration.

It relates to an epidemic following after that intriguing fever of 1675 already alluded to above. He has pondered over this and its successors with special fondness, and now he encounters the prevalence of 1679 which has been hailed by modern epidemiologists as an influenza trailer. This led him formally to abandon the impression he had at first entertained that the fever of 1679 was something new. He says it must be reckoned as a common "intercurrent," and he styles it the "winter fever"; then later still (Sched. Mon., 1, 4) he explains that, while at first disposed to regard this "winter fever" as just an "intercurrent"—i.e., as "a bastard peripneumony which occurs in all winters alike," he now realises that it is entitled to rank as a stationary fever; he proceeds, therefore, to execute a full-length portrait of it (Sched. Mon., 1), and there it stands, an unmistakable example of a cerebro-spinal influenza of the seventeenth century, of which the London cerebro-spinal fever of 1915 was, as was claimed at the Royal Society of Medicine at the time, an indubitable lineal descendant. In the final paragraph of Sydenham's account (loc. cit., 46) he has another inspiration, for he says of this stationary fever, "It may be a spirituous and subtle beginning of something else, the germ perhaps of the depuratory fever now exploded, but which the plague followed." Of course, as we now know, it was the precursor of the influenza of 1688, just as the London cerebro-spinal fever of 1915 was the precursor of the great influenza of 1918.

The new light afforded by demonstration of the relationship of this fever of 1685 to the succeeding influenza, and especially the clear recognition, which has just been noted, by Sydenham of the possibility, nay likelihood, that this 1685 fever was identical with the stationary fever ("depuratory fever") of 1661–64, in which he had been so greatly interested nearly a quarter of a century previously, enable us step by step to trace the development of his maturing view that the standard fever of 1661–64, that of the winter of 1675, the depuratory fever, the "winter fever" of the Postscript of 1683 above referred to, the fever of 1685, and we must now add the influenza of 1688 (though that was the year of Sydenham's death), were all phases of one abiding influence. There is here, in fact, the germ of that modern conception "endemic influenza."

In recent discussions regarding Sydenham's Constitutions at the Royal Society of Medicine, while there has been some difference of opinion on the general questions at issue, there has been practical unanimity concerning the special application of his thesis to epidemic prevalences associated with influenza. It may be of interest, therefore, briefly to indicate the extent to which twentieth century findings concerning the influenzal constitution were adumbrated by Sydenham.

In the first place, Sydenham's account of his fifth constitution, that of part of the year 1673 and of the whole years 1674 and 1675, is now recognisable as the classical description of an influenzal constitution. It comprehends a widespread influenza occurring (to use Sydenham's terminology) in a setting of "comatose fevers." This series of prevalences quite plainly furnishes the almost exact counterpart to the great influenzas of 1918 with their precursors and trailers. Thus, following upon comatose fevers in 1673 and 1674, we are told, the fever of 1675 "spread its ravages far and wide" in July (exactly, it may be noted, in passing, as it did in 1918); the attack was first upon the bowels and then the head, the fever, however, "having the predominance and taking the lead of the other maladies of the year." The notion was entertained by some, says Sydenham, that the complicating "dysentery and diarrhœa which did so much mischief arose from these two diseases; whereas in reality they were to be imputed to the fever" (i.e., to influenza). "Everyone, however, who had any practice among the sick, knew the predominance of the fever and knew also that the aforesaid dysentery and diarrhœa were symptoms rather than essential and primary diseases." (Med. Obs., V., i., 5; see also V., ii., 23.) "This was the course which was held by the fever throughout the autumn, sometimes it attacked the head, sometimes the bowels. It everywhere put on the symptoms of the particular part affected." At the end of October the weather "suddenly changed to wet and cold. This brought on coughs and catarrhs, which" (says Sydenham) "were more numerous than ever I remember them to have been," and upon these "supervened the stationary fever, of the year (as in October–November, 1918), and this, having once taken its hold, increased, and varied in some of its symptoms from the fever of the previous part of the year" (attacking, however, now the lungs and pleura instead of the head and bowels). At the end of November the catarrhs and coughs suddenly decreased. "The fever, however, remained as before, just as it was before the catarrhs" (V., i., 7). "All that suffered, suffered first in the head, back, and limbs; these being the symptoms" (of the influenza, as we should say, but keeping Sydenham's wording it reads) "which were most constant to the non-pleuritic fevers, which preceded and which characterised them to their close." (VI., i., 6.)

Sydenham's description is unmatchable for vision, precision, and terseness of expression; moreover, he explicitly reiterates, again and again, that while the bowels, brain, and lungs were successively attacked, the accompanying diarrhœa, stupor, and pneumonia were all merely symptomatic of one stationary fever, and the characteristic marks of that fever he stamps most unmistakably upon it.

In the second place, it is clear that the pulmonary trailer of 1679 riveted Sydenham's attention upon the special type of prevalence with which the influenzas of "the 'nineties" made Western Europe so familiar; after much study and reflection he concluded that the said fever recurring winter after winter was identifiable not only with the fever of 1685 (see R.S.M., loc. cit. 1915) and thus heralded in that "spirituous and subtle something" (the influenza of 1688), but was also identifiable with the "depuratory fever," which had accompanied and been found to be interchangeable with the "intermittents" of 1661–64 (i.e., with the gastro-intestinal, pulmonary, and nervous trailing epidemics) following the great influenza of 1658.

Then, thirdly, we have Sydenham's statement (M.O., V., vi., 2) regarding the interchangeability of the intermittents and the stationary fevers, which "ran parallel with them"; and he formulates the thesis (letter to Dr. Brady, para. 56) that in intermittents "Nature works hastily and gets over in less time than is regular the processes by which she first tempers and afterwards discharges the morbific matter." "Depuratory fevers," he adds, "are different: 13 or 14 days elapse before the appearance of any signs of the concoction of the febrile matter, which is then to be ejected by sweats; or rather by a somewhat free transpiration." Again, in para. 57, he contrasts the later "humoral or earthy fevers, which cleared the blood but slowly," with the earlier fevers of the same constitution, "which were subtle in principle, intermittent in type and did their work more rapidly."

Elsewhere[1] the application to the study of the influenza wave of this mutation theory of Sydenham has been discussed; to use modern phrasing, he is contending that the virus of influenza works more easily and rapidly near the crests of the pandemics and with more difficulty and more slowly in the intervening troughs.

Furthermore, there may also be deduced from Sydenham's own writings the conclusion that between the widespread prevalences on the crests of the great pandemic influenza waves and the depuratory fevers (or endemic influenzas) of the troughs, ripples of intermittents appear, both on the ascending and descending slopes of the great ocean rollers. Sydenham, as is well known, identified the intermittents of 1675–79 (following the great influenza of 1675) with those of 1661–64 (following the great influenza of 1658); but he also makes it clear (IV., i., 5 and 6) that similar intermittents preceded both the influenza of 1675 and that of 1688 (Sched. Mon. I., 46).

Let us recall his statement made in 1675 (I., ii., 21–23):

"I may state at once, that to reduce into classes all the species of epidemics, to arrange them according to their phenomena, to work out their several idiopathic characteristics, to determine in detail the proper method of treatment for each of them is a work so difficult, an arrangement requiring so much leisure and opportunity, a cycle so little coincident with any recognised sequence of years, that the lifetime of no single physician would suffice for the collection of a sufficiency of data." But he was better than his word, for we find him later adding material contributions to what (in 1675) he had described as "My mite, such as it is, towards the foundation of a work, that in my humble judgment shall be beneficial to the human race."

As so much has been said and thought recently concerning influenza, it may be of interest to refer to a question forced into prominence of late years, that of the damage inflicted by that disease upon the nervous system. The relation of cycles of genius to

[1] Proc. Roy. Soc. Med., 1927, xx., Epidem. Sect., 60–61.

prevalences of influenza was recently undertaken with a view to ascertaining whether "influenza years" were years in which such damage especially resulted. In the first instance the attempt had been made to obtain confirmation of the suspicion that influenza plays a part in the causation of insanity. The records of insanity, however, are of such recent date, and are so beset with fallacies, as to make this task an exceedingly difficult one; it seemed then to be a more practicable plan to begin, as it were, at the other end—i.e., with men of genius, and to try to ascertain whether the extent to which their nervous systems are damaged by influenza can be gauged with any approach to accuracy.

At first sight it was surmised that the influence, if any, might be expected to be most conspicuously revealed at the age of special intellectual development and of main output of mental work, say at 25–50. On further consideration it was decided to examine in like manner a corresponding graph for the earlier age-period 0–25. Later still it seemed desirable that the graph for ages 50–75 should also be constructed. The three graphs present some resemblances and some noteworthy contrasts.

As they relate to the same lives at different age-periods—in youth, in early and in later maturity, respectively—it is obvious that the three contours will show a considerable degree of resemblance. On examining the special effect of groups of "influenzal years" it is at once apparent that they operate prejudicially in all three graphs, but their evil influence is most discernible in the 0–25 graph.

The marked influenza periods of the last three centuries—1657–93, 1708–18, 1729–43, 1757–67, 1780–90, 1798–1807, 1824–37, 1842–51, 1857–64, 1890–95, and 1915–25, were scrutinised seriatim to ascertain the depth of the depression produced at these times in the outlines of the graphs for 0–25, 25–50, and 50–75 years of age respectively. In the case of each depression an *index* was obtained representing the proportion of loss per number of lives at risk for each group of influenzal years. This index was found to vary from practically *nil* in three instances to the *highest limit* of approximately one-half.

The question at once rises whether on the average these indices approximate to what might have been expected a priori in dealing with *any* epidemic disease causing mortality in the population at large and incidentally influencing the output of work by men of genius?

In the first place, no epidemic disease of which precise statistics are available causes such ravages as are shown in these graphs relating to the influenzal group of diseases. Limiting consideration, then, to that group, the greatest recorded rates of mortality for the population as a whole was that of 1918. The total London loss from influenza in that year was about 18,000, rather more than one-fifth of the total deaths registered. So high an "index" as this was not forthcoming in any earlier group of years, though the *proportion of total deaths to population* was equally high in two individual years of special influenza prevalence during the middle third of the eighteenth century. The average index, taken over the whole of the prevalences of the last 250 years, was clearly very much less than one-fifth.

It is hence apparent that the influenzal group of epidemics leave their impress to a quite excessive extent upon men of marked ability as compared with the population as a whole.

It was, in bygone times, almost a commonplace that sweat, influenza, and "volatile typhus" affected "gens aisés," "people of the court," and the "noblesse," in contradistinction to other epidemics which specially attacked the poor, badly housed, and ill-nourished.

One reason for this excessive class incidence may have been that those who used their heads were more liable to suffer than those who used their hands. We must, in fact, be prepared to accept the conclusion that the widespread prevalences of influenza during the last two and a half centuries have levied a specially heavy toll upon men of marked ability; and in some conspicuous instances the facts are on record that the influenzas of past times again and again attacked notable men and women. Chopin, Sterne, Swift, Jane Welsh Carlyle, and William James may be referred to as instances of this, and for the abrupt termination of the lives of many remarkable men (from Shakspere and Cromwell onwards) influenza was presumably responsible.

The critic may urge that, while appreciating that something may be said for approaching the study of epidemiology from the "big endian," as opposed to the "little endian," point of view, he would like to know whether it is likely that anything of *practical* value will result from adopting this method of approach, say, for example, in the case of influenza. Certain conclusions may at any rate be drawn. Influenza is, as Noah Webster said years ago, the "crux of epidemiology." It is not merely, as it was long supposed to be, a "pandemic disease" reappearing once or twice in a generation, but it is ever present, now smouldering and then every 10, 15, or 20 years, bursting into flame. Its great prevalences are especially favoured by war, famine, overcrowding, and free communication with sufferers from the disease in the early stages of their illness. Despite, however, the huge increase of means of intercommunication and traffic during the last 100 years, coupled with entire absence of systematic attempts to limit spread of the disease by sufferers in the early stages of illness, the mortality in London from the influenzal group of diseases appears not to be appreciably greater in proportion to population than it was 150 years ago. The influences that have made for good have been improved feeding, better housing, greater cleanliness, and provision of medical and nursing care in serious cases; but now while continuing to develop resistance on these lines, there *should be added*, thereto, carefully considered measures for preventing sufferers from mixing freely with their fellows in offices, schools, conveyances, and places of assembly, as they do at present while in the early highly infectious stages of illness; above all, it must be appreciated that the most extravagant and bizarre efforts made, under the influence of panic, at times of widespread prevalence, are as nothing compared with steady and continued prosecution of a considered campaign against the influenzal group of diseases, conducted on epidemiological lines.

The conclusion from a survey of the last century of epidemiology would then appear to be that already reached by a number of Chadwick lecturers. It was first stated, however, by Sir William Collins, in a form in which it is particularly applicable to epidemiology in an address on "Physic and Metaphysic," delivered to the Abernethian Society on Feb. 16th, 1905. Sir William, quoting Dr. Martineau, says:—

> "Laplace, in scanning the heavens with his telescope, could find no God, and Lawrence declared that the scalpel in dissecting the brain came upon no soul. Both are unquestionably true, and it is precisely the truth of the second that vitiates the intended inferences from the first. Had the scalpel alighted on some perceptible soul we might have required of the telescope to perform a similar task; and on its bringing in a dumb report have concluded that there was *only mechanism there*. But in spite of the knife's failure, we positively know that conscious thought and will *were* present, yet no more visible yesterday; and *so* that the telescope misses all but the bodies of the universe and their light avails nothing to prove the absence of a living mind through all. If you have the wrong instrument the objects of your search may well evade you. The test-tube will not detect an insincerity or the microscope analyse a grief."

This question of instruments assumes nowadays very great importance in connexion with epidemic disease, for epidemiologists using field implements sometimes glean very different conclusions from those deduced by bacteriologists employing laboratory implements. As an example "food poisoning" may be referred to. The epidemiological evidence has gradually accumulated during the last three and a half centuries. Dr. J. J. Walsh (International Congress of Medicine, 1913) carries us back to the food poisonings of the Middle Ages, which, he says, were in the main cases of illness (often apparently of infectious illness) with obscure abdominal or cerebro-spinal symptoms; and thus the characters of those supposed "pitiless poisoners," the Borgias, were taken away owing in part presumably to unrecognised prevalences of gastro-intestinal and cerebro-spinal influenza. Ozanam also testifies that epidemic encephalitis was often regarded as due to poisoned food. Crookshank has carefully set out the evidence for acceptance, as cerebro-spinal influenza, of much of the "convulsive ergotism" of past centuries. Even as recently as 1888 we find the

Middlesbrough outbreak of pneumonia ascribed to food. Lichtenstern, however, spoke confidently of "influenza dinners" in the early 'nineties, and Bulstrode's report on the Greenwich outbreak of 1893 was typical of many others in which influenza and not food was presumably at fault.

But the whirligig of time brings in its revenges and many supposed food outbreaks of the 'nineties were studied exclusively from the bacteriological point of view; again, during the recent influenzas, botulism ran riot in the Western States of America and both here and on the continent large numbers of reports on food outbreaks appeared, in which "causal organisms" (complying with appropriate serological tests) were described and exhaustively studied, from many points of view, but not from that of possible association with the prevailing epidemic. In a recent report [2] mention, however, is made of a "considerable number of cases which are ascribed, often very confidently, to food poisoning without any justification." Moreover, we learn that "Medical officers and others have sometimes limited their interest and activity to tracing the outbreak to some given article of food" . . . while "the more distant sources have been left untraced"; even in the report in question, oddly enough, no mention is made of influenza, though the survey relates to outbreaks occurring during years of widespread prevalence of that disease.

The records of these recent years, in fact, abundantly bear witness to the need that field observations and field research should have place as well as laboratory observations and laboratory research, the two sets of findings being placed alongside one another and coördinated together. Given such a consummation, it may be surmised that, in public health, as in other scientific work, an "Age of Professionalism and Specialism" will slowly but surely give place to an age in which interest will be taken in general principles as well as in stubborn and irreducible facts. This is the lesson, which he who runs may read, in the history of epidemiology during the last hundred years.

THE INTENSIVE SERUM TREATMENT OF SEVERE DIPHTHERIA.

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This article contains preliminary observations upon the treatment of severe diphtheria by large doses of antitoxin, administered chiefly by the intravenous route. This has been a routine measure for over a year in the City of Leicester Isolation Hospital and, although the period is short, the results justify this report. Perhaps the most striking feature is the reduction in the hospital death-rate from diphtheria. The average death-rate calculated upon all completed cases—i.e., those discharged or died—during the 11 years 1916–26 was 9·3 per cent., the lowest mortality in any year being 7·3 per cent., and the highest 13·2 per cent. The new method was adopted on April 1st, 1927, and during the succeeding period of 12 months—i.e., to March 31st, 1928—the death-rate was 2·6 per cent. Excluding laryngeal cases and patients dying within 12 hours of admission, the death-rate was 1·7 per cent. The chart shows the reduction.

The 300 verified cases dealt with during the period included no less than 27 malignant or severely toxic cases of diphtheria (Group A), most of whom, according to our former experience, would have died under the older method of treatment whereas, under the new conditions, only six died. The very toxic cases amounted to 9 per cent. of the total, and this figure approximately corresponds with the average death-rate for past years. On the other hand, the number of laryngeal cases was exceptionally low during the period, and this fact would tend to keep the death-rate low. Nevertheless, we are convinced that the reduction actually effected in the mortality was chiefly due to the number of severe toxic cases which recovered under the intensive method of antitoxin treatment.

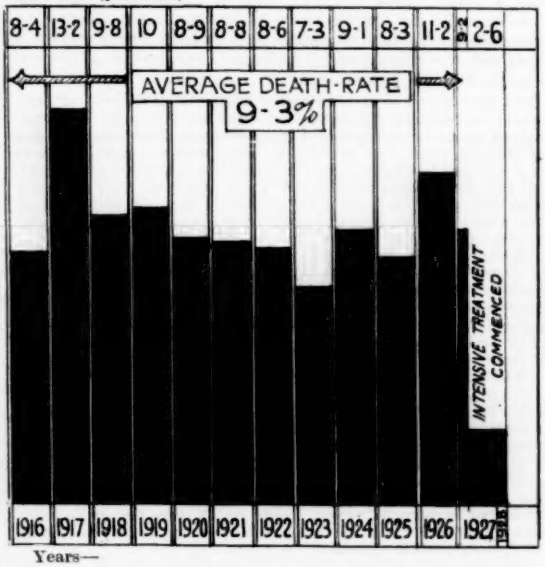

Chart showing the percentage mortality of cases of diphtheria treated at the Leicester Isolation Hospital from 1916–28.

Classification of the Cases.

During the year 326 cases were discharged from, or died in, the diphtheria wards, and of these 26 were proved to be not suffering from diphtheria and have been excluded. Of the 300 verified and completed cases, seven were infants with laryngeal diphtheria. The remaining 293 cases have been classified for convenience into three groups, according to the extent of the local manifestations and the degree of toxæmia. Following out the five points of the scheme detailed below and knowing the subsequent history, we have had little difficulty in assigning each case to its appropriate group. The classification cannot always be made with certainty when the case is first admitted, but is generally easy after a few days.

Group A (malignant or severely toxic) comprised 27 cases having the following five outstanding clinical features:—

(1) *Extensive diphtheritic membrane* involving fauces, tonsils, uvula, soft palate, and naso-pharynx. In some the membrane extended over the hard palate even to the teeth and in others covered the nasal mucous membrane. Towards the spreading margin the membrane usually presented a semi-transparent glistening appearance with an ill-defined edge; these characteristics usually signify a rapid spread. Œdema of the fauces adds to the gravity of the case.

(2) *Cervical adenitis and peri-adenitis* of severe degree, the swelling in the neck having the typical rounded contour. The condition varied from the extreme "bull-neck" with enormous uniform swelling all round the neck to the type which might almost be described as unilateral. In no case was the size of the swelling less than that of a hen's egg.

(3) Nasal discharge generally profuse, sometimes hæmorrhagic, very rarely scanty.

[2] Med. Research Rep., 1925, No. 92.

(4) Fœtid odour from the throat, typical of severe diphtheria.
(5) Toxæmia of severe degree characterised, inter alia, by delirium, stupor, and coma in the worst cases, and by great lethargy and hebetude in the others.

Group B (moderately toxic), consisted of 52 cases having the above features, modified as follows:—

(1) Extent of membrane: the tonsils, one of both pillars of fauces, and a small area of soft palate or naso-pharynx covered.
(2) Cervical adenopathy: the cervical glands enlarged to about the size of a walnut and with some degree of periadenitis.
(3) Nasal discharge: scanty or absent.
(4) Fœtor from throat: generally nil; sometimes could be detected.
(5) Evidence of toxæmia: the quiet, subdued demeanour of diphtheria, but with mental alertness.

Group C (moderate and mild) comprised the great bulk of the cases (214 in number) and had the following features:—

(1) Extent of membrane: not spreading further than the pillars of the fauces.
(2) Cervical adenopathy: enlarged glands palpable in most cases but not visible.
(3) Nasal discharge: scanty or nil.
(4) Fœtor from throat: generally nil; sometimes could be detected.
(5) Evidence of toxæmia: the quiet, subdued demeanour of diphtheria, but with mental alertness.

Dosage of Antitoxin Employed.

All cases deemed on admission to belong to Group A had antitoxin administered both intravenously and intramuscularly in doses varying from 70,000 to 200,000 units. Generally the dose given on admission was about 50,000 units intravenously and 20,000 intramuscularly. In a few of the worst cases doses up to double these amounts were given on admission. Where there seemed to be an insufficient response in about 12 hours' time a second dose was given. The chief indications for a second dose were: (1) The local condition: the membrane should have begun to become opaque with well-defined raised margins, showing that spread had ceased; the cervical swelling should have become correspondingly reduced. (2) The general condition: the patient should have become appreciably brighter and more alert, showing a diminution of the toxæmia. The latter point is the test par excellence of the adequacy of dosage in the severe toxic cases of diphtheria. If there is no improvement or inconsiderable improvement in the dull stuporous mental condition, then a second large dose of serum intravenously is most certainly indicated. More serum was given 24 and 36 hours after admission if there were insufficient signs of arrest of the disease or of the toxæmia. The average dose of serum actually given in the 27 cases of this group was 71,000 units intravenously and 31,000 units intramuscularly.

In Group B the first dose was generally about 20,000 units intravenously and 8000 to 16,000 intramuscularly. Occasionally a second dose was required. The average dose for the 52 cases of Group B worked out at 19,000 units intravenously and 19,000 units intramuscularly. In Group C no departure was made from the well-recognised dosage for moderate and mild diphtheria—viz., 8000–16,000 units intramuscularly. The average dose in this group worked out at the rather high figure of 14,000 units. This was due, no doubt, to some excess of caution where it was doubtful on admission whether the case should be classified in Group B or Group C.

Technique.

The technique of intravenous injection of large amounts of serum in young children does not, as a rule, present much difficulty after some practice. It takes time, however, and one of more assistants are generally necessary.

The vein of choice is the median basilic at the bend of the elbow, and if failure is encountered here in both arms a superficial vein in front of the ankle-joint or over the dorsum of the foot is explored. In the youngest infants the finest hypodermic needle, and in older children a medium or large bore hypodermic needle is employed. The serum is injected directly from 10 c.cm. or 20 c.cm. Record syringes, preferably with eccentric nozzles. The whole amount to be injected is ready at hand in the syringes before the puncture is made. A tourniquet is applied to the upper arm, and one assistant keeps the arm firmly hyperextended by pressing on the triceps area with one hand and on the anterior aspect of the wrist with the other. When the puncture is made it is essential to withdraw a little blood into the syringe before attempting the injection, since otherwise the needle-point may not be lying actually within the vein. The serum is necessarily injected slowly through such a fine needle, and care must be taken to avoid the entry of air-bubbles into the vein. In detaching the syringe from the needle great care is required to avoid dislodging the needle-point from the vein. The second syringe, full of serum, is attached to the needle as soon as a drop of blood appears at the needle-mount. When the requisite amount of serum has been injected the syringe is detached and the needles left in the vein, and our present practice is then to inject 4 to 8 minims of adrenalin intravenously by attaching a hypodermic syringe. Alternatively ½ c.cm. of pituitrin may be injected intramuscularly. The time taken in the whole process of intravenous injection may be as long as 20 minutes in young or fractious children. Very few children offer resistance, since the injection is painless. Indeed, all children prefer intravenous to intramuscular or subcutaneous injection.

The concentration of serum which we have found suitable is about 1400 units per c.cm., but the viscosity, rather than the concentration, is the important point. Serum of higher concentration is exceedingly difficult to push through the bore of a fine hypodermic needle, while a lower concentration involves the injection of a greater amount of foreign protein.

Immediately after the injection the child is covered with warm blankets and packed round with hot-water bottles, and the foot of the bed is raised. In other words, he is treated prophylactically for the rigor and collapse which has occurred in half our patients within half to three hours. The prophylactic administration of intravenous adrenalin, or of intramuscular pituitrin, promises to reduce the incidence and severity of these reactions.

The rationale of intravenous injection of serum is obvious since the maximum concentration of antitoxin in the blood occurs immediately, whereas after intramuscular injection it occurs in 24 hours, and after subcutaneous injection the maximum concentration is not present for three days.[1] Six hours after an intravenous injection of serum there is ten times more antitoxin in the blood than after subcutaneous injection of the same amount, and 24 hours after intravenous injection there is twice as much in the blood as would have entered it by the subcutaneous route.[2] For these reasons, in toxic cases, the major part of the serum required is injected intravenously for immediate effect, and a relatively smaller amount is given intramuscularly at the same time. The position must be reviewed after 12 hours, and further doses given if required.

This method of treatment differs from standard teaching only in the total amount of serum given. Park's view (1921), based on laboratory and statistical evidence, is that "amounts of antitoxin beyond 25,000 units in a child and 50,000 in an adult, are absolutely unnecessary and useless, and that an initial dose of 10,000 units in a child and 20,000 units in an adult is probably sufficient for the whole course of the disease."[3] Goodall states (1928) that in his experience any amount of serum over 30,000 units, even when spread over two or three days, is wasted.[4] Our practical experience of the past year is in direct opposition to these views. Since we commenced this work we have learned with great interest that V. Bie, of Copenhagen, working on similar lines, has been using doses up to 200,000 or even 300,000 units since 1920. We are indebted to him for sending us particulars of his results for the year 1927, from which it appears that in a series of 1456 cases admitted to his hospital the death-rate was 1·3 per cent. These figures exclude laryngeal cases and patients dying within 24 hours of admission. He divides his cases into eight groups, giving the mortality in each group, and states (in a personal communication) that the death-rate in each group and the total death-rate have remained practically unaltered since he began to use the large doses.

Reactions following Intravenous Serum.

In Group A 11 cases out of 27, and in Group B 19 cases out of 37, receiving intravenous serum had an allergic reaction within half to three hours of the injection. The reaction is generally alarming and includes rigor, pallor, prostration, weak pulse, cyanosis about the lips, anxious staring expression, and pyrexia from 104° to 107° F. It lasts, as a rule, only a few minutes, and is followed by sweating and gradual return to the status quo. It is now treated prophylactically. If necessary, adrenalin, up to 2 c.cm. intramuscularly or 1 c.cm. intravenously, may be injected during the attack. Generally 1 c.cm. intramuscularly is sufficient. We have had no fatality from this reaction, nor has Bie in eight years' experience, but he nearly lost one adult, and considered that he saved the patient by injecting 1 c.cm. of adrenalin intravenously after 2 c.cm. intramuscularly had failed to relieve the condition. On account of this experience, Bie does not now give more than 50,000 units intravenously at a time—i.e., 50 c.cm. of the serum which he uses. We have, however, given as much as 140,000 units intravenously in a single dose, with no reaction whatever, while in another case a dose of 8000 units intravenously was followed by a rigor. The reaction seems to bear a lesser relationship to the size of the dose than to individual idiosyncrasy.

Serum rashes were very common in the first or second week but gave no cause for anxiety.

Isolation Hospital, Leicester.—Particulars of verified cases of diphtheria discharged or died during period April 1st, 1927, to March 31st, 1928.

—	A. Malignant or severely toxic.	B. Moderately toxic.	C. Moderate and mild.	Laryngeal.	Total.
Cases	27	52	214	7	300
Percentage of cases in each group	9	17·33	71·33	2·33	—
Av. dose of serum (antitoxin units) ..	I.V. 71,000 I.M. 31,000	I.V. 19,000 I.M. 19,000	14,500	I.V. 22,000 I.M. 29,000	—
Paralysis—					
Palate	10	4	3	0	—
Slight cardiac.	8	12	24	2	—
Severe ,, .	6	1	1	3	—
Immediate serum reactions ..	11	19*	—	—	—
Deaths	6	nil	nil	2	8
Percentage of deaths in each group	22·2	nil	nil	28·6	—

*37 had I.V. Serum.

1. Death due to diaphragmatic paralysis, 43rd day.
2. Hæmorrhagic diphtheria: cardiac vomiting, &c., 11th day.
3. Hæmorrhagic diphtheria: cardiac paralysis, 5th day.
4. Hæmorrhagic diphtheria: cardiac paralysis, 4th day.
5. Cardiac vomiting, &c., 7th day.
6. Early cardiac failure, 3rd day. Laryngeal case.
7. Hæmorrhagic diphtheria: died 1¼ hours after admission.
8. Early cardiac failure: 3 hours after admission (membrane extending to bronchi). Laryngeal case.

Complications of Diphtheria in this Series.

The intensive method of serum treatment reduces not only mortality but also complications, especially the more serious forms of paralysis. In Group A (27 cases) the six who died had, as would be expected, severe paralysis of the heart. Of the remaining 21 cases only eight showed signs of the slighter forms of myocarditis, including extrasystoles and partial heart-block, and only ten had palatal paresis, while ciliary paresis and paresis of limbs were still rarer. Cardiac vomiting and paralysis of swallowing are now extreme rarities in these wards. Considering the extremely severe toxic condition of the cases in Group A on admission, this record is very favourable. In Group B, comprising 52 cases, 37 had intravenous serum and 15 had intramuscular serum only. Of the former seven had slight cardiac palsy (from which all recovered) and one had palatal paresis. In the 15 intramuscular cases there were six cardiac and three palatal pareses, a considerably higher incidence of paralysis than in the intravenous cases. The relative infrequency of severe paralysis greatly lightened the nursing in the convalescent stage. The difference in the actual work of the wards is quite marked. All the anxiety occurs in the acute stage or within the first two days, and after that things go smoothly.

Another way of estimating the effect of the treatment is to consider the average duration of residence in the hospital of recovered cases in Group A. This amounted to 70 days. All who are familiar with the painfully slow recovery of the survivors of the Group A type of patient under the older method of treatment know that it often involves four to six months' residence in hospital.

One of the most remarkable features of our diphtheria wards during the past year has been the rapidity with which almost every patient regained brightness of demeanour and outlook. Finally, in only one of the cases treated by large doses of serum intravenously did the carrier state occur. In this case only out of 64 cases receiving intravenous serum was departure delayed from hospital owing to persistent positive swabs. This, however, may be mere coincidence.

Objections to the Intensive Method.

Three main objections may be urged against the intensive serum treatment of diphtheria. These are: (1) expense; (2) additional work, particularly to the medical staff; and (3) danger from allergic reaction. It must be admitted that the annual increase in serum costs has been about £300 in the Leicester Isolation Hospital. Against this must be placed the saving in life, represented by a reduction of mortality from 9·3 per cent. to 2·6 per cent., and also the saving effected by the curtailment of the period of hospital treatment and lessened nursing costs. This in itself is probably sufficient to balance the additional cost of the serum. Toxic diphtheria should be regarded as an acute emergency, like a gangrenous appendix or a perforated gastric ulcer. It requires immediate expert medical attention and generally takes up half an hour of the doctor's time. It cannot properly be left to nurses, or even to medical men who merely give a haphazard subcutaneous injection of serum, which is equivalent to postponing operation on a gangrenous appendix for three days. The danger from the allergic reaction can be fairly met by prophylactic treatment and the use of adrenalin or pituitrin.

References.—(1) J. Morgenroth and R. Levy (1912), quoted in Med. Res. Council Report on Diphtheria, 1923, p. 257. (2) W. H. Park (1921) quoted in Manual of Infectious Diseases, London, Claude B. Ker, p. 431. (3) Ibid. (4) E. W. Goodall: A Text-book of Infections Diseases, London, 1928, p. 197.

PAYING PATIENTS AT NEWCASTLE-ON-TYNE.—The annual report of Newcastle-on-Tyne Throat, Nose and Ear Hospital records that 12 months ago, owing to lack of support, some of the beds had to be closed. Rather than keep the beds unoccupied it was decided to use them for paying patients, and as a result they have been fully occupied.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN.—At the annual meeting of this hospital the Earl of Chesterfield, the President, stated that the work was being carried on under makeshift conditions, in a private dwelling which had been adapted and had long been outgrown. There are only 33 beds, whereas at least 50 are needed, together with accommodation for private patients and young children, and space for using the latest scientific methods. In 1927 the 229 in-patients stayed on an average 41 days. The hospital owns in the Uxbridge-road abundant freehold ground for building, but lacks means.

INFLAMMATIONS AND FISTULÆ OF THE SALIVARY GLANDS

AND THEIR TREATMENT.*

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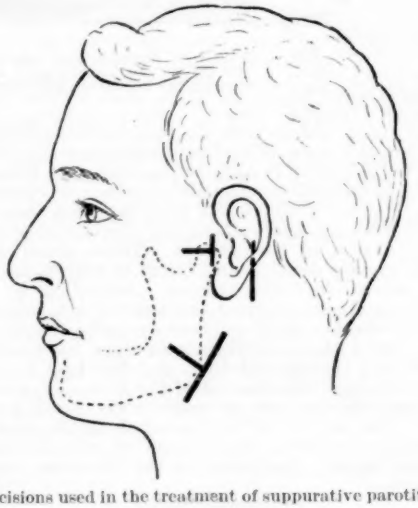
THE parotid, submaxillary, and sublingual glands are all developed from the lining epithelium of the primitive mouth in essentially the same manner. The primordium of each gland is originally a solid cord of cells growing from the epithelium into the underlying mesenchyme. The cords branch and subdivide, lumina appear, and the apices of the terminal ducts finally become dilated to form acini. The proximal portion of the original outgrowth becomes the main duct. The rudiment of the parotid appears in embryos of 10 mm.—that is, about the sixth week of intra-uterine life. It commences near the angle of the mouth in the upper alveolo-labial sulcus, grows backwards over the outer aspect of the masseter muscle, the external carotid artery, the temporo-maxillary vein, and the facial nerve; it finally expands in the recess between the lower jaw and the meatus and mastoid process. The submaxillary and sublingual glands appear later as outgrowths from the epithelium lining the alveolo-lingual groove in the floor of the mouth, at about the 11 and 12 mm. stages, that is about the seventh week of fœtal life. Whether the salivary glands are derived from ectoderm or entoderm is a question to which no certain answer can be given. If all structures developed from epithelium covering the maxillary and

FIG. 1.



Incisions used in the treatment of suppurative parotitis.

mandibular arches are ectodermal in origin, then the parotid glands, anterior part of the tongue, and the floor of the mouth and presumably also the submaxillary and sublingual glands, are derived from ectoderm, although some authors contend that the last named are entodermal. Mucin cells do not appear until the sixteenth week of fœtal life.

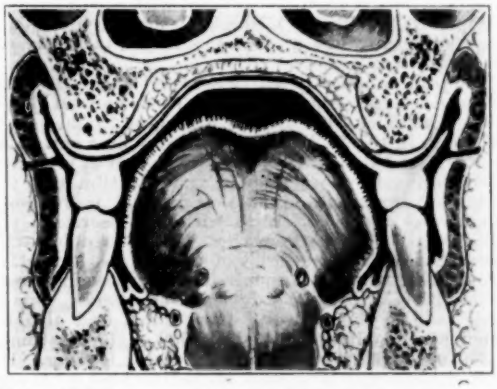
Complete absence of the salivary glands is a very rare condition. Xerostoma or dry mouth may occur in children and adults, occasionally in several members of the same family. This is not due to absence of the salivary glands, but to suppression of the glandular secretion.

* Abstract from Erasmus Wilson lecture delivered at the Royal College of Surgeons of England on Feb. 22nd, 1928.

Suppurative Parotitis.

This condition is, in my experience, most frequently met with in the insane, especially in those who have to be forcibly fed by the mouth or nose. These patients always have dry mouths, even when food is being administered. There is a definite lack of

FIG. 2.



Section through the mouth showing the relation of an upper denture to the parotid duct on each side.

psychical juices and of appetite, and indeed a definite feeling of repulsion for food. Infection reaches the parotid via Stenson's duct, and the first sign is usually swelling and fluctuation of the gland. General resistance on the part of the patient is so poor that the temperature and pulse exhibit very little variation from normal. If early incisions are not made the pus finds its way to the surface by bursting into the external auditory meatus at the junction of the osseous and cartilaginous portions. These cases are nearly always fatal unless free incisions are made into the gland. The gland itself undergoes necrosis and large sloughs are formed; these should always be removed.

Cope [1] reported seven cases of acute necrotic parotitis which occurred in debilitated soldiers in Baghdad during the extremely hot summer of 1917. These cases appear very similar to those which occur in mental institutions in this country. Early free incisions are imperative; mere puncture of the gland or probing it with sinus forceps is useless. The incisions advocated by Legg and Cope are very useful and allow of free drainage (see Fig. 1). Even when drainage is established the mortality is high, mainly owing to the lack of resistance. The administration of rectal and subcutaneous saline is impossible in mental cases. The author has seen ten cases among patients suffering from a depressed confusional state associated with delusions. Of these eight died.

Post-operative Parotitis.

This is now becoming rare, and as its pathology is known it should disappear entirely. In 10,210 operations performed at King's College Hospital between 1900 and 1910, 32 cases (0·313 per cent.) of parotitis occurred, all after laparotomies, while in 17,585 operations performed at the same hospital between 1918 and 1927 there were 18 cases (0·102 per cent.) of parotitis. This reduction is due to the fact that gastric and abdominal cases are more carefully prepared, and that rectal saline, with or without potassium bromide, is administered in almost every case. Further, oral sepsis is now treated before any abdominal operation is contemplated, while before 1910 oral sepsis was neglected and dental treatment was almost unheard of in the wards of a hospital. Wagner,[2] writing in 1904, stated that the mortality of post-operative parotitis was 30 per cent. In my first series (i.e., 1900 to 1910) the mortality was 37·5 per cent., while it has dropped in the second series (i.e., 1918 to 1927) to 16·6 per cent. This

reduction is due to earlier operative interference in the way of incision and drainage. Incision should not be delayed until fluctuation can be elicited. It is only in the later stages of suppurative parotitis that fluctuation can be made out; this is due to the fact that the parotid is encased in a very firm capsule derived from the cervical fascia, and the texture of the gland is very firm. A ⊥-shaped incision should be made and the skin and parotid capsule incised; the gland should then be explored with a pair of sinus forceps or a probe. A single ⊥-shaped incision is often sufficient, but at times multiple incisions are necessary.

The total amount of saliva secreted in the 24 hours has been estimated at 2000 c.cm. If the parotid glands are responsible for half of this, one gland would secrete 500 c.cm. in the 24 hours or just over 20 c.cm. in an hour. Thus there is a continuous stream of secretion flowing down the parotid duct, and infection from the mouth is almost impossible in normal individuals. Should any factor interfere with this secretion the liability to infection increases. There can be little doubt that the vast majority of cases of post-operative parotitis are caused through infection passing from the mouth via Stenson's duct to the gland. This is borne out by the figures I have given and also by Fenwick's [3] results published in 1909 of the treatment of 300 cases of hæmatemesis by rectal feeding. He allowed his patients to suck an indiarubber teat, and did not have a single case of inflammation of the parotid gland. Rolleston and Oliver [4] found that in the medical treatment of 1000 cases of gastric ulcer the percentage of parotitis in the cases which are treated by oral starvation is 4·5 per cent., while the percentage is only 0·4 per cent. in the cases which are allowed fluid by the mouth. Fisher, of Ohio,[5] however, considers that post-operative parotitis is hæmatogenous, and that the predisposing factors are cachexia and malnutrition, causing a lowering of

FIG. 3.

Method of suture in cases of recent injury to the parotid duct. A piece of silkworm gut acts as a dowel.

the patient's resistance. He also believes that "the secretion of the gland is under the influence of nerve stimuli, and that the incidence of post-operative parotid involvement is neurologically dependent upon surgical shock or inhibition of the secretory and trophic fibres from higher psychic centres." This opinion does not seem to me to be physiologically sound, as the secretion of the parotid is probably dependent on two factors only: nervous and chemical stimulation. That the second exists is proved by the fact that if the nerve supply of the gland is cut off secretion still continues, a so-called paralytic secretion which is the result of chemical stimuli (vide infra).

Occasionally unilateral or bilateral parotid swellings are due to a large upper denture which causes irritation of the gums and obstruction of the orifice of Stenson's duct. The first case that came under my observation was a woman aged 45 who had an upper denture fitted, and after wearing it for two days came up to hospital complaining of a swelling of the face and limitation of movement of the jaw. Her history was that the swelling began during breakfast and gradually increased in size. Distinct lobulation of the parotid gland could be felt, and Stenson's duct could easily be traced across the cheek. The orifice of the duct in the mouth was difficult to find, but while looking for it and at the same time pressing on the duct a plug of mucus was expelled into the mouth: this was followed by a flow of saliva and the disappearance of the parotid swelling. My curiosity was aroused by this case, and I looked up the literature and found that Jardet [6] recorded four cases occurring in adults in 1920. The condition is generally due to a badly-fitting denture (Fig. 2) which is not cleansed daily. The remedy is a properly fitting denture combined with the use of a potassium chlorate mixture, as this salt is excreted via the saliva.

FIG. 4.

Method of forming a new opening into the mouth by means of a suture through the buccal mucous membrane.

Fitzwilliams [7] has recorded an interesting condition of emphysema of the tissues of the face and neck which is brought about by inflation through the ducts of the salivary glands. Apparently self-inflation was a common form of malingering among the Chinese labour battalions in France during the Great War. The men would fill their mouths with as much air as possible and then strike their cheeks rapidly; this caused air to be forced gradually along the ducts and into the smaller canals of the glands. These small canals became greatly swollen and burst in places, allowing air to escape into the tissues. According to Fitzwilliams no alarming symptoms resulted, nor were there any after-effects; the emphysema rapidly disappeared. I have tried the experiment on dogs by passing a cannula into the parotid duct, and find that it is very easy to produce emphysema of the face and even half the body, the amount of emphysema being proportional to the amount of air forced along the duct and the pressure exerted. The symptoms are alarming at first, but usually disappear by the following day.

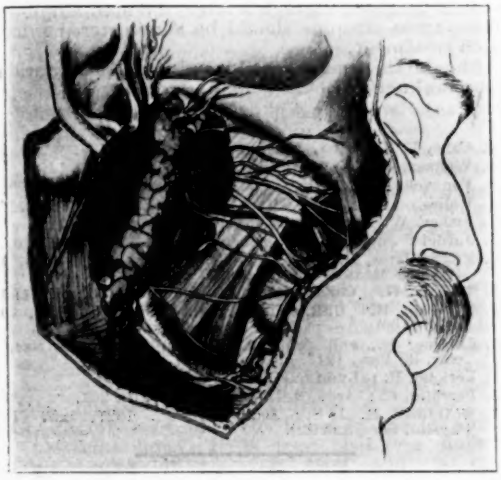
Salivary Fistulæ.

The only fistulæ of practical importance are those in connexion with the parotid and its duct. Fistulæ of the submaxillary gland tend to heal of their own accord; the rare cases which do not are easily treated by excision of the gland. Parotid fistulæ may be divided into two groups: (1) fistulæ of the duct, (2) fistulæ of the gland.

Fistulæ of the parotid gland and duct are most frequently caused by injury or suppuration around a calculus. Operations for removal of glands in the upper part of the neck may cause injury to the lower part of the parotid. A small fistula may result which tends to heal at once; if, however, the wound becomes infected a permanent fistula invariably results. The nearer fistulæ of the parotid are to the gland the more difficult they are to cure. They never tend to heal

spontaneously, and the portion of the duct in front of the fistula frequently becomes stenosed and sometimes obliterated. Should the fistula be situated in front of the masseter muscle operation will often cure. In recent cases, such as a stab injury, the wound should be opened up and the two ends of the duct isolated.

FIG. 5.



Dissection of side of face showing the relations of the facia nerve to Wharton's duct.

A piece of stout silkworm gut is passed from the mouth through the orifice of Stenson's duct and out on to the face; it is then passed into the proximal portion of the duct and thus acts as a dowel. The wall of the duct is sutured over the piece of silkworm gut, and the skin wound closed. In order to prevent a clot forming in the duct at the line of suture the silkworm gut is retained in situ until the patient recovers from the anæsthetic. This method is only of use when the wound is recent (Fig. 3). Tees [8] advocates the use of catgut to act as a dowel, but the catgut swells and may cause complete blocking of the duct. If in a recent case there is difficulty in getting apposition of the divided ends of the duct the proximal portion should be ligatured; in the absence of sepsis this will cause atrophy of the parotid. If, however, infection is present septic parotitis will follow. Treatment by the ligature method is far from new and has recently been revived by Morestin [9] in France.

In old-standing cases of premasseteric fistula the following procedure will sometimes suffice. A straight needle threaded with silk is passed through the fistula into the mouth; the needle is then unthreaded and the piece of silk outside the mouth is threaded on to it. The needle is then inserted through the fistula into the mouth a second time. The two ends of the silk are then tied in a knot. The included piece of tissue which is strangulated by the suture dies and sloughs, and by this means an opening is made into the mouth. As the parotid secretion has now a free vent into the mouth the fistula heals (Fig. 4).

Fistulæ of the parotid duct which are situated in the proximal part—namely, over the masseter muscle—are, as may be imagined, very difficult to cure, and nearly 30 different operations have been devised. Most of them leave considerable scarring on the face, frequently damage the lower branch of the facial nerve, causing paralysis of the muscles at the angle of the mouth, and rarely cure the condition (Fig. 5). To my mind there is only one justifiable procedure, and if this fails, the secretion of the parotid should be cut off by dividing the auriculo-temporal nerve. The procedure is an old one, but is much neglected at the present day, when operative interference for every condition is carried out only too frequently. By means of a small fine malleable probe which is passed from the mouth along the duct and out of the fistula on to the face, a piece of silk is attached and drawn out on the face. To the end of the silk is attached a fine piece of drainage tubing, and this is drawn out of the fistula, leaving one end in the mouth while the other is projecting on the face. Saliva may find its way along the side of the drainage-tube into the mouth. After a few days the drainage-tube is drawn so far into the mouth that it no longer projects from the fistula. Finally after a week it is withdrawn altogether. In some cases the result of this method is admirable and the fistula remains completely closed; should infection of the duct be present, however, the rubber tube may cause parotitis.

FIG. 6.

Method of exposing the auriculo-temporal nerve. It can be seen lying just behind the superficial temporal artery.

There is only one certain method of closing a fistula of Stenson's duct when sepsis is present, and that is by division of the auriculo-temporal nerve. This method was first advocated by Leriche [11] some 15 years ago. Since that time several surgeons, among whom Morestin [9] and Ferraini [12] may be mentioned, have given this method a good trial with excellent results. In the seven cases of fistulæ of Stenson's duct that I have treated by division of the auriculo-temporal nerve I have used a modification of Leriche's method. Instead of a horizontal incision in front of the external auditory meatus, a vertical incision is made. This gives much better exposure, and the superficial temporal artery is not so liable to injury. As the nerve is situated immediately in the deep aspect of the artery, if the latter structure is retracted it can easily be exposed (see Fig. 6); the nerve is then divided with a knife, the proximal portion grasped with a pair of Spencer-Wells' forceps, and as much of it as possible avulsed by firm traction. The fistula healed quite quickly, and after a month the amount of secretion coming via Stenson's duct into the mouth

FIG. 7.

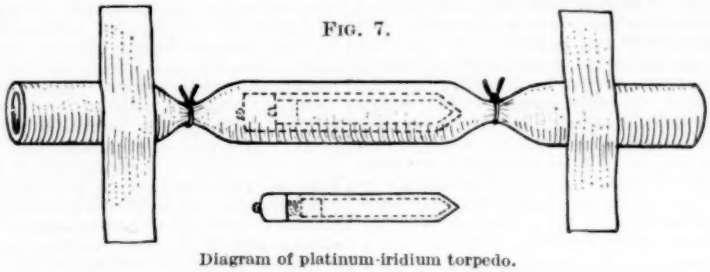
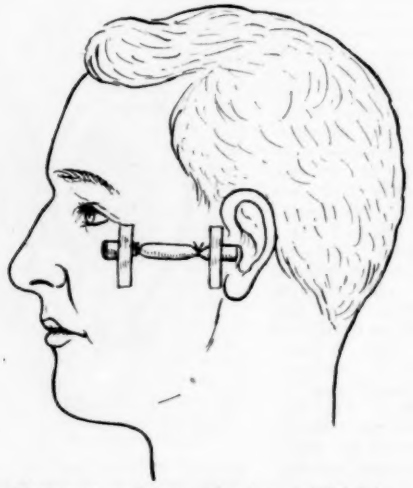


Diagram of platinum-iridium torpedo.

was reduced by one-half. Even division and avulsion of the proximal end of the auriculo-temporal nerve does not cause complete cessation of secretion of the parotid gland. Further, the secretion, which may be termed a paralytic secretion, persists for years, the longest period of which I have a record being six years.

The presence or absence of secretion from the gland is investigated by applying a little citric acid to the tongue and side of the mouth. If the gland is secreting

FIG. 8.



Method of applying radium to parotid fistula.

a drop of saliva can always be seen at the papilla on the inside of the cheek. The secretion after division of the nerve is always much less than that of the other side, but the methods of observation in human subjects are not very accurate. One would hesitate to place small cannulæ into the orifices of both parotid ducts and try and collect the saliva therefrom; the risk of infection and its aftermath, septic parotitis, is too great. The most likely cause of the paralytic secretion is chemical stimulation. It may therefore be assumed that the normal secretion of the parotid is not only dependent upon the secreto-motor nerve-supply, but also upon some chemical stimulation. Langley has suggested that a local nervous mechanism may be responsible, but more recently McDowall [13] has pointed out that the activities of the parasympathetic are apparently the same as that of alkali, as judged by the effect on the heart, the pupil, and the blood-sugar. He states that this effect of alkali appears to be increased when the nervous connexions of the organs are increased. It may be, then, that when the nervous control of the gland is removed the normal alkalinity of the blood is sufficient to maintain secretory activity.

Fistulæ of the Parotid.

Fistulæ of the parotid gland tend to heal of their own accord. For those which do not the two methods of treatment are: (1) Radiotherapy, and (2) avulsion of the auriculo-temporal nerve.

Radiotherapy rarely fails to cure and is quite simple; 250 mg. of radium is enclosed in a platinum iridium torpedo, the thickness of which is 0·5 mm. The torpedo itself is encased in another platinum tube, 0·5 mm. in thickness, in order that the beta radiations may be cut off. The platinum tube is then placed in a rubber tube to facilitate its application (Fig. 7). The fistula and its surrounding parts are covered with lint, in order to cut off any secondary radiations from the metal filters (Fig. 8). A four-hour application is usually sufficient, but should the skin be somewhat thickened and indurated from the constant discharge of saliva, a six-hour application is advisable. Whatever length of application is used, it is advisable to give a hypodermic injection of atropine (gr. 1/100) half an hour beforehand; this lessens the secretion of the gland during the time the radium is being applied.

X rays have been used in the treatment of parotid fistulæ but are not so constant in their action. Three pastille doses, with a weekly interval between each, should be given through a filter of 3 mm. aluminium. Here again atropine should be administered prior to each treatment.

Should this method fail, avulsion of the auriculo-temporal nerve should be performed.

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THE RHEUMATIC LUNG.

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(WITH COLOURED PLATES.)

THE term "Rheumatic Pneumonia" is an old one and was more in vogue in the medical literature of a past generation than of to-day. Possibly this is because the acute rheumatic fever of adults is now less common.

The condition I am about to describe contrasts so much clinically with what we usually know as pneumonia, that I prefer to use the simpler term, "rheumatic lung."

The microscopical appearances of these consolidations (1) indicate an inflammatory reactive process; (2) are unlike anything hitherto described in the human lung; (3) are remarkably constant from case to case; and (4) bear a strong resemblance to the lesions described by Aschoff and Tawara,[1] Carey Coombs,[2] and others, as pathognomonic of rheumatic infection in other parts of the body. If these contentions can be established, we have not only a demonstration of an entirely new type of inflammation of the lungs, but also a strong confirmation of the thesis advanced by Carey Coombs that the lesions of "rheumatism" (childhood type) show a specific form of reaction and therefore indicate probably a specific virus.

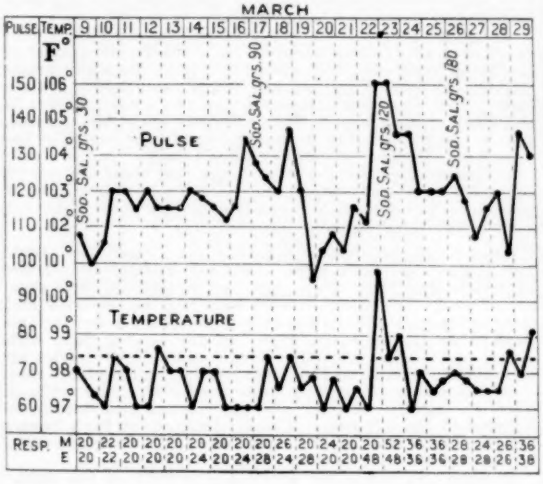
During the past two and a half years I have obtained post-mortem material from six of my patients who have displayed this peculiar consolidation of the lungs. Not all were children, their ages being respectively 7, 8, 9, 13, 26, and 33; but all gave evidence of active rheumatic infection, with the possible exception of the woman of 33, who had mitral stenosis, but whose heart muscle was unfortunately not examined to determine the presence or absence of Aschoff's nodules.

I propose to deal first with the general clinical aspect of this condition, then to describe the naked-eye and microscopical appearances of the lungs, and finally, after a brief description of the individual cases, to summarise and discuss my conclusions.

General Clinical Considerations.

Those who have experience of disease in childhood are familiar with certain more or less extensive patches of dullness which are liable to appear over the back of the chest in children suffering from active rheumatic carditis. They appear insidiously, being frequently unaccompanied by pyrexia or noticeable increase of respiratory-rate, and are therefore only detected by routine examination. Cough is sometimes present at the onset, but is of a mild variety and attracts little attention in a patient already seriously ill. The dullness sometimes appears quite rapidly, extending perhaps over the greater part of one lobe in the course of two or three days; it then may remain stationary over a long period lasting into months, and, finally, may clear up as rapidly as it began. The breath sounds over the dull area are often loudly bronchial, but there is every grade between this and muffled or completely absent respiratory sounds. During the quiescent stage no adventitious sounds are heard, but if the stage of onset is observed a few soft crepitant sounds are not infrequent.

It has been held by most observers that this dullness is present at the left base only, and, following the old observation of Bamberger [11] that dullness in this situation is common with pericardial effusion, the condition is usually considered to be a collapse of the lung due to the pressure of an enlarged heart or distended pericardial sac. My own observations, however, spread over a number of years, directly contradict the belief in the immunity of the right lung. It is true that the dullness usually begins at the left base and is most intense in that situation, but careful percussion will often reveal slighter dullness and altered breath sounds on the other side, and in a few cases the dullness is most intense on the right. It was, in fact, this last observation that first made me seriously doubt the current theory of collapse, and it will be seen from the post-mortem reports of the six fatal cases that in all of them the right lung was affected, and to about the same extent as the left. The reason for the earlier appearance and greater frequency of



left-sided affection will be discussed at the end of this paper.

Although this condition appears only in those severely affected by rheumatism, yet it does not usually appear to add much to the gravity of the prognosis, and the great majority live for the dullness to clear up. The cases recorded in this paper showed a much more rapid extension of the dullness than is seen in the average case, and the symptoms were naturally more acute, but even in these it was remarkable how little the temperature and respirations were affected by the onset of the lung consolidation.

Take, for instance, the case of W. W. (see Chart), who had been in bed, under observation, for six weeks previous to the first appearance of a small patch of dullness at the angle of the left scapula on March 25th. Although the dullness increased at such a rate that by the 29th the whole of both sides, back and front, appeared to be dull, yet the respirations were for the greater part of these four days between 24 and 28 per minute, and the pulse-respiration ratio was approximately 4¼ to 1. The temperature showed a brief rise on March 22nd, three days before any lung dullness was detected, but during the period when the dullness was so rapidly extending, the temperature was mostly subnormal. With regard to the temperature it must be noted that most of the patients were taking salicylate of soda, and that E. W., who was not, showed a temperature quite comparable to that of an ordinary pneumonia. In spite of this she, in common with the other patients whose temperatures were low, showed a p./r. ratio of approximately 4 to 1. The respirations were not only slow but there was scarcely any respiratory distress throughout the series of cases; the one definite exception being the case of I. D., in whose pericardium there was half a pint of fluid.

Cyanosis was very noticeable during the last day or two of life in those patients whose lungs were nearly solid throughout, but the amount of lung solidification in proportion to the degree of intensity of respiratory symptoms was throughout the series a surprising phenomenon.

Morbid Anatomy.

Macroscopical.—The extent of the pulmonary consolidation was a remarkable feature. In one case (W. W.) the only aerated parts seemed to be a strip along the anterior border of each lung, and most of the right middle lobe. In another (I. D.) all parts of both lungs were affected, but the upper lobes appeared to contain some air. In another (E. C.) the right lung was completely solid throughout, but the left, though very largely solid, floated in a submerged position in water. In another (A. B.) three-quarters of the right lung and a quarter of the left lung were solid. The other two showed consolidation of both lower lobes. There was no sharp demarcation between solid and air-containing lung.

The appearance of the affected parts was quite characteristic and unlike that seen in any other form of pneumonia. Its consistency was not unlike that of solid indiarubber, very tough, and non-friable on the cut surface. The colour, on section, was a shade of purplish red, quite homogeneous in tint and showing none of the "granite" or "marbled" appearance of other pneumonias. Scraping with the knife produced no exudation. In one case the bronchi exuded a blood-stained fluid on pressure.

So characteristic were the naked-eye appearances that in the case of E. W. the condition was recognised at once by our pathologist, although she had seen only one case previously.

Microscopical.—Before describing the microscopical appearances I will quote from Coombs' [3] description and explanation of the submiliary nodules of the heart.

"The nodules consist of a groundwork of fibrin, surrounded and interrupted by various cells. Of these, the most important are certain large cells which form the characteristic feature of the nodule; there are also leucocytes and plasma cells."

"The characteristic large cells vary a little in shape according to the shape of the space in which the nodule develops; in rounded nodules the cells are often globular, but even in such they may be fusiform, and this is the form they tend to take. That they are soft is shown by their taking shape from one another so as to give flat sides and quadrilateral outlines to each. The largest cell is of such a size that, measured from pole to pole, it is equal to one-third or one-quarter of the diameter of the microscope field, as seen with 1000 magnification. Its cytoplasm, which is very finely granular, takes both basic and acid dyes readily, so that the cell is a dark object in the field. In some the cytoplasm looks opaque and the cellular outline is apt to

be lobular; such cells are probably being destroyed by toxins, perhaps by those which call them into being. There may be as many as seven nuclei in one cell, apparently without any plan of arrangement; though as many of the cells are so narrow that they can carry but one nucleus abreast, they lie in a sort of chain along the long axis of the cell. The chromatin thread of the nucleus stains sharply with hæmatoxylin, each nucleus appears as a space bounded by a thin black line and clear centrally except for several sharp black dots which represent cross-sections of the chromatin thread.

"The stages of the tissue reply to irritation by the *Streptococcus rheumaticus* would appear to be as follows: First, the endothelia of the smaller blood-vessels and lymphatics proliferate; this is manifested in partial or complete occlusion of vessels, with or without thrombosis, in the dissemination of "endothelial leucocytes," which are mainly collected in perivascular foci, and in the building up of new capillaries. Second, the perivascular connective tissues display a fibroblastic reaction, especially around the newly formed capillaries. Third, leucocytes arrive in the disturbed area; in most areas the polymorphonuclears are represented but sparingly, but the more severe the attack, the more likely they are to appear, and in some spots they even dominate the picture, especially where large vessels are closed by inflammatory thrombosis. The usual appearances, therefore, are those of a blood-borne infection of a virulence so moderate that it is for the most part dealt with successfully by the first line of defence—the vascular endothelia."

On comparing under the low power sections of the lungs from my cases with those from a lobar or broncho-pneumonia, certain contrasts are seen at once.

PLATE I. is from a typical broncho-pneumonia and shows large alveolar cavities with thin walls, the cavities being nearly filled with a mass of fibrinous exudate and polymorph leucocytes slightly shrunken away from the walls, and such red blood corpuscles as are present in the walls are nearly all contained within small vessels.

PLATE II. is a microphotograph from W. W. (Case 6). The alveolar walls are seen to be some 8 or 10 times as thick as in the former plate; the red blood cells are not contained within vessels, but are widely diffused among the other cells of the walls; the cavities of the alveoli are quite small and are encroached on by small outgrowths from the walls.

PLATE III. shows: (1) proliferation of the endothelium lining a capillary; (2) outgrowth of similar endothelial cells in all directions, so as to make it difficult to distinguish wall from cavity; and (3) general diffusion of red blood cells among the endothelial cells.

PLATE IV. enables us to see the cells which are in all parts of the section like those described by Coombs.

These cells form the immensely thickened walls and are seen budding out in little tufts into cavities of the alveoli. In some places the walls can be traced with fair ease, but in others, where apparently the process has reached a more advanced stage, the alveolar structure has been entirely replaced by masses of these cells, either packed closely together or drawn out into a syncytioid mass. Multinucleate cells are fairly frequent, though I have not found any cells with more than five nuclei. In all but one of my cases these endothelial cells form the vast majority of the structure, being mixed with only a few fibroblasts and polymorph leucocytes, but in one (J. J. C.) the polymorphs were quite numerous, though even here there was the same massive endothelial background on which the leucocytes were dotted. A still later stage of the process shows the endothelial cells beginning to form new blood-vessels. In one very acute case the mediastinal glands were enlarged and very red, and sections showed not only a notable vascularity but the invasion and replacement of considerable areas of lymphoid structure by endothelial cells of the same type. In cases where the heart muscle was cut, typical Aschoff's nodules were found.

The following is the description kindly written for me by Dr. Clara Tingle, pathological assistant to the Sheffield Royal Hospital.

"Large endothelial cells are the predominating ones found in this condition. They are constantly present and in large numbers. The average diameter appears to about 4–6 times that of a red cell, but they vary according to the pressure put upon them by surrounding structures. The majority of these cells are mononuclear, the nucleus being equal in diameter to about one-third the diameter of the cell. Many cells, however, are multinucleated, there being in some instances as many as five or six nuclei per cell. In these "giant cells" the nuclei are separate from one another and are arranged irregularly within the cell. The nuclei always appear as a dark-staining ring with a central space, which often is unstained but which sometimes shows darkly staining dots. The cytoplasm stains deeply and is faintly granular. Sometimes carbon pigment is found within the cells. (I have not found any showing active phagocytosis to other cells.) In areas where these cells are fewer in number they tend to be wholly within the alveolar walls, causing thickening and distortion of these structures, but in areas where the change appears more advanced the cells lie in large numbers within the alveoli. They are accompanied by red blood cells and a few plasma cells, and the alveolar contents do not tend to retract from the walls during preparation of the section as they do in lobar or broncho-pneumonia. There are also found a few areas in which the lung structure is completely lost and is replaced by a mass of these cells separated only by red blood cells, plasma cells, and a few fibroblasts."

Individual Cases.

The following are short descriptions of individual cases:—

CASE 1.—I. D., male, aged 8. Admitted Dec. 9th, 1925; died Dec. 19th, 1925. Onset two months ago; pain in the left chest and back; sweating; frequent abdominal pain; occasional joint pain; always tired; dyspnœa on exertion; no sore throat.

On admission: Tongue furred; immense tonsils; muco-purulent discharge from the naso-pharynx; no nodules; no pallor. Heart: There is much visible pulsation; the left border 5 in. from the middle line; systolic and diastolic murmurs at the apex. Lungs: Crepitations and slight dullness at the left base.

Dec. 15th: Heart breadth 6¼ in.; pericardial friction. 17th: Dullness and crepitations at right base. From this time onwards increasing respiratory distress and inability to lie on left side.

Pulse-rate: Varied from 120 to 145 throughout stay in hospital. Temperature: 100·4° F. on admission, slowly falling to normal on the 13th; on the 15th it rose again to 101·2° F., falling to normal on the 17th. Respirations: From Dec. 9th to 15th, 20 to 36 per min., the average being about 28. From Dec. 15th to 18th, 36 to 40 per min., and within the last 30 hours before death rising rapidly to 78. P./r. ratio approximately 4½ to 1 up to the 15th and from then 3¾ to 1 to the day before death.

Autopsy.—Pericardium contains half-pint of clear fluid; small area of fibrinous exudate on the anterior surface of the right ventricle; the whole of the pericardial surface slightly dulled. Tricuspid and mitral and aortic valves show small pale vegetations, on the two former valves in the form of long narrow bands on the auricular surfaces, but on the aortic in the form of groups in the centre of the ventricular surface of each cusp. Lungs: Massive consolidation of the whole of both lungs, but some air can be squeezed from both upper lobes; the consolidation is of india-rubber consistency; non-friable; purplish red; cut surface not like granite.

CASE 2.—E. W., female, aged 26. Admitted Jan. 13th, 1926; died Jan. 17th, 1926. Had rheumatism and chorea in childhood. Run down and lost weight for one year. Seven weeks ago taken ill with pain first in the back and then in the right side of the chest; sweating; in bed for two days; then up for seven days; relapse for ten days with cough and slight delirium added; again three weeks up and about; then, on Jan. 12th, 1926, temperature rose.

On admission: Breathing quite comfortably and without distress. Heart: Rapid; size not determined owing to dullness of the left lung. Lungs: Dullness at both bases; breath sounds weak at the right base; bronchial breathing at the left base.

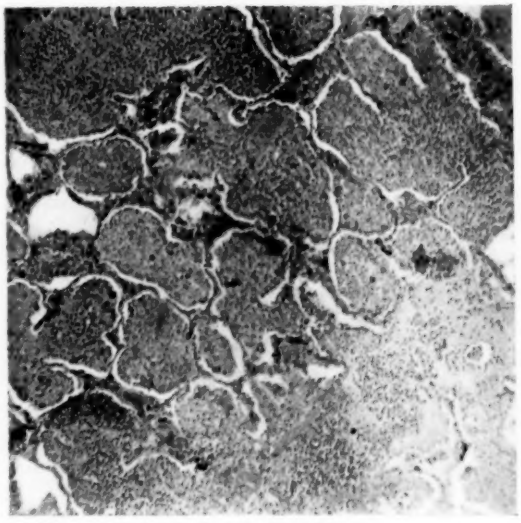
Progress: Spread of the dullness, especially on the right; bilateral friction; jaundice by the 15th; never any respiratory distress.

Pulse-rate from 120 to 150. Temperature from 101° to 105°. Respirations from 28 to 36; above 36 only during the last 24 hours of life. P./r. ratio approximately 4½ to 1 during first three days; 3¾ to 1 during last 24 hours before death.

Autopsy.—Pericardium: Fibrinous pericarditis with recent adhesions; hypertrophy of the left ventricle; old mitral stenosis; a few small pale vegetations over auricular surface of mitral valve. Lungs: A little fibrinous pleurisy at both bases; both lower lobes airless; upper lobes congested; bronchioles exude blood-stained fluid on pressure. The consolidated part india-rubber like; very tough; non-friable; homogeneous in colour.

DR. A. E. NAISH: THE RHEUMATIC LUNG.

I.



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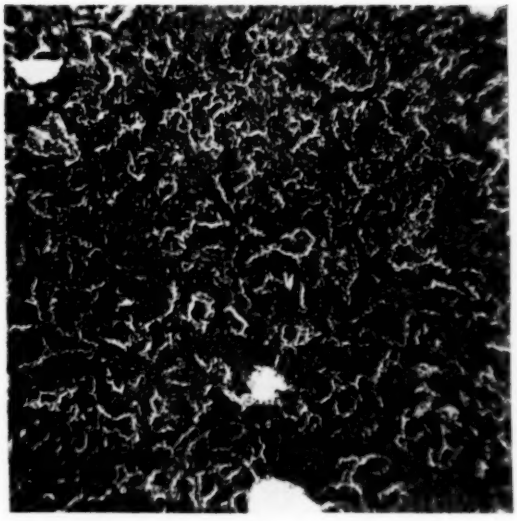

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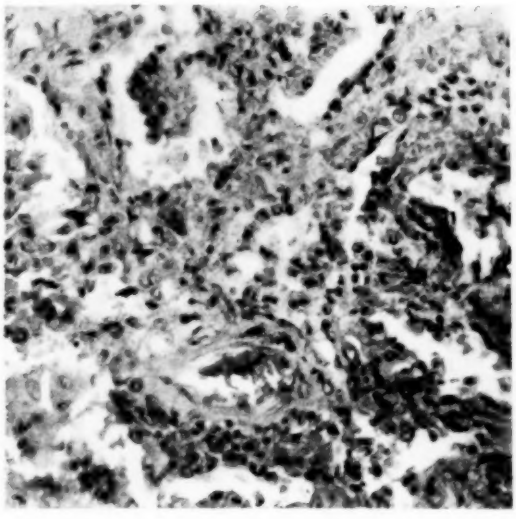

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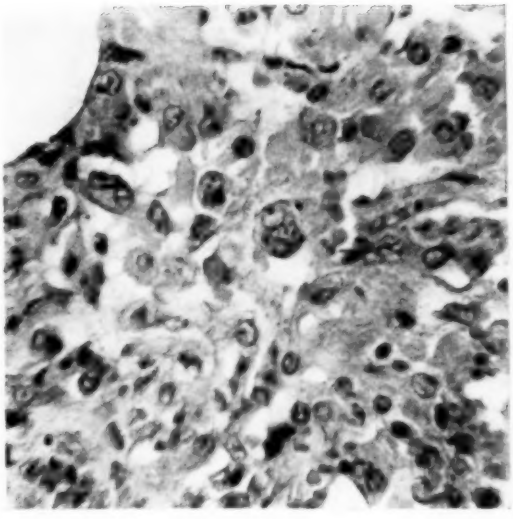

PLATE I. (× 60) is from a typical broncho-pneumonia and shows large alveolar cavities with thin walls, the cavities being nearly filled with a mass of fibrinous exudate and polymorph leucocytes slightly shrunken away from the walls, and such red blood corpuscles as are present in the walls are nearly all contained within small vessels.

PLATE II. (× 60) is a microphotograph from Case 6. The alveolar walls are seen to be some 8 or 10 times as thick as in the former plate; the red blood cells are not contained within vessels, but are widely diffused among the other cells of the walls; the cavities of the alveoli are quite small and are encroached on by small outgrowths from the walls.

PLATE III. (× 280) shows: (1) proliferation of the endothelium lining a capillary; (2) outgrowth of similar endothelial cells in all directions, so as to make it difficult to distinguish wall from cavity; and (3) general diffusion of red blood cells among the endothelial cells.

PLATE IV. (× 520) shows in all parts of the section the characteristic large cells described by Coombs.

CASE 3.—E. C., female, aged 13. Admitted March 13th, 1926; died March 20th, 1927.

December, 1926: Sore throat and pain in the knees; was in bed two weeks and afterwards was kept from school. Feb. 17th, 1927: Came to the out-patients' and was advised to stay in bed. March 7th: Much worse; weakness and pain in the knees.

On admission: Pallor. Heart: Dullness 1¾ in. to the right and 5 in. to the left of the middle line; systolic and diastolic murmurs at the apex. Lungs: No dullness detected.

March 18th, 1927: Vomiting; cyanosis; restlessness; pain; dullness at the left base; pericardial friction; liver very large. March 19th: Dullness at right and left bases, which subsequently increased rapidly.

Pulse-rate, 100 to 120. Temperature on first two days after admission, 98·8° F.; after that, never above 98·4° F. Respirations up to the 16th, 20 to 28, afterwards 22 to 40. P./r. ratio approximately 4½ to 1, except for a brief period about 24 hours before death.

Autopsy.—Pericardium: A little fibrinous exudate about origins of great vessels and less at apex; about 2 oz. fluid in sac. Heart: Muscle flabby and mottled; moderate dilatation; small vegetations at bases of aortic cusps and on auricular surfaces of mitral and tricuspid valves. Lungs, pleuræ: A little fibrinous exudate at right base; whole of right lung solid; sinks in water; tough, non-friable; non-granite-like. Left lung similar but less affected, many parts floating; consolidation not circumscribed.

CASE 4.—A. B., female, aged 33. Admitted March 31st, 1927; died March 31st, 1927.

History.—Rheumatic fever at 7 years old; heart affected; very delicate since; frequent aching of limbs; pneumonia in 1922. Dec. 31st, 1925, became ill with bilateral chest pain and cough; admitted on Jan. 3rd, 1926, showing widespread râles, friction at left base, and double bruit over the cardiac apex. The râles cleared up within a week, leaving a patch of dullness, bronchial breathing, and increased vocal vibrations at the left base, which in turn cleared after a few days. The temperature was never above 100, and for a good part of the acute stage was subnormal. Respirations after first two days, 20. After this she returned to her usual state of invalidism. For a few days before death more dyspnœic but not laid up, and she actually walked up to the out-patient department on the day of her death.

On admission: No notes of importance, owing to her rapid death shortly after admission.

Autopsy.—Heart: Dilatation and hypertrophy of right ventricle and right auricle; dilatation of the left auricle. Mitral valve sclerosed; button-hole orifice admitting one finger. Pericardium, normal. Lungs: Consolidation of the whole of the right lower lobe and one-third of the right middle lobe; slight consolidation at the left base; consolidated parts show rubbery consistency, toughness, non-friability, and homogeneity of colour.

CASE 5.—J. J. C., male, aged 9. Admitted Sept. 7th, 1927; died Jan. 28th, 1928. Three years ago had an illness called pneumonia, since then has had pain in the left chest; dyspnœa on exertion; listlessness; poor appetite; sweating. Lately, bumping of the heart.

On admission: Languid; pale; sweating. Heart: left border 5 in. from the middle line; double bruit at apex, the diastolic murmur being loud. Lungs: nothing abnormal detected. During September vomited from time to time.

Oct. 3rd, 1927: Nodules on occiput, right wrist, left elbow, and left external malleolus. No evidence of pericarditis or pulmonary consolidation. Looked very ill. Respiratory average about 31. Antistreptococcal serum given on Oct. 10th, 18th, 25th, and Nov. 2nd. Nov. 14th: Much better, nodules nearly gone. Through the rest of November and December very well.

Jan. 7th, 1928: Pain in knees and chest; 9th, vomiting; 11th, rash of raised red patches, heart dullness 2½ in. to right and 5½ in. to the left of the middle line; 13th, dullness at left base, no bronchial breathing; 16th, 17th, 18th, and 23rd, antistreptococcal serum; 20th, dullness at the right base. Temperature range, after the 7th, was usually 99° to 100° F., but there was a rise on the 7th to 101·4° F., and another between Jan. 12th and 17th to a maximum of 101·6° F. Respirations from 23 to 32 up to Jan. 24th, after this 32 to 36. Pulse-rate averaged 120. P./r. ratio approximately 4 to 1 up to last 48 hours.

Autopsy.—Heart: very large; largest diameter 7 in. Right auricle much dilated; other cavities moderately so. Pericardium adherent; no recent pericarditis. Lungs: Complete consolidation both lower lobes; india-rubber consistency; non-friable; purplish-red, not mottled.

CASE 6.—W. W., male, aged 7. Admitted Feb. 14th, 1928; died March 30th, 1928. Movements for past two months.

On admission: Acute chorea; pallor; wasting; indifference to surroundings; nodules on right occiput, each elbow, near metacarpo-phalangeal joints and on dorsa of both feet. Heart: Breadth 4 in., soft-blowing apical systolic murmur. Progress: Steady improvement; after 2½ weeks, better colour; scarcely any chorea; appears plumper; taking interest and chatting.

March 16th: Pulse-rate went up and the cardiac dullness was enlarged by 1 in. 22nd: Rise of temperature; heart-rate, 160; respirations, 52; vomiting; diastolic bruit at apex. 25th: Small area of dullness at angle of left scapula; crepitations; respirations, 36. 26th: Dullness increasing; respirations, 28. 27th: Dullness and crepitations at right base; respirations, 24 to 28. After this very rapid increase of dullness. P./r. ratio very seldom below 4 to 1.

Autopsy.—Heart: Moderate dilatation of the right ventricle, left ventricle, and right auricle. Valves: Aortic and mitral, vegetations in groups along the line mid-way between attachment and free edge; mostly white, but small hæmorrhagic points. No pericarditis; no increase of pericardial fluid. Lungs: A few ounces of fluid in either pleural cavity. Nearly solid; only right middle lobe and anterior free edges showing any air. Consolidation is of india-rubber consistency; non-friable; purplish-red; cut surface, not like granite. Mediastinal glands: The size of beans; very red; semi-soft. Liver: Large and fatty. Mesenteric glands: Similar to mediastinal.

Discussion.

The appearance of the lungs in these cases is apparently quite different from anything that has been hitherto described. Dr. Robert Hutchison informs me that over 20 years ago the pathologist at the London Hospital, Dr. Salaman, prepared sections from the lungs of a rheumatic case and found similar appearances, but that the slides were lost. Pichon and Lardé-Arthés [4] have described what they call "multiple pulmonary infarcts" in association with active carditis, which will be referred to in a moment. Coombs, Miller, and Kettle [5] have described a remarkable endothelial proliferation of the vessel walls in the lungs of rabbits which have been inoculated with virus from rheumatic cases. Apart from this I have been unable up to the present to find any precise accounts in the literature of pathological examination of these pulmonary consolidations.

These lung appearances are strikingly like those described by Coombs [3] in cardiac submiliary nodules, the main difference being that they suggest an earlier stage of development in which endothelial proliferation entirely overshadows fibroblastic reaction. It is also to be noted that in the lung preparations there is evidence of considerable effusion of red blood corpuscles from the damaged capillaries, whereas this is not a feature of the submiliary nodules. This, too, I take to be an indication of an earlier stage of development before absorption of cells has taken place. The highly vascular nature of the alveolar wall must also be taken into consideration in making a comparison with the rheumatic lesion in other sites.

In this connexion it is interesting to bring forward microscopical appearances from another case to indicate that endothelial proliferation and effusion of red blood cells are closely connected. A girl of 17 years (D. Q.), under the care of my colleague, Prof. Arthur Hall, died on Nov. 5th, 1925, with pericarditis and pulmonary consolidation. The greater part of the lung section showed an ordinary broncho-pneumonic reaction with the red blood cells contained in little groups within the capillaries, but in certain small portions of the slide there was obvious blood effusion, and here the endothelial proliferation was most remarkable, the large cells budding out in long strings.

At this point I should like to discuss the case recorded by Pichon and Lardé-Arthés.[4] The so-called infarcts, which were scattered about in an irregular fashion through the lungs and had no sharp margin or definite shape, were attributed by the authors to rupture of vessels by high pressure (it was expressly stated that embolism or thrombosis of vessels was carefully looked for without success). The microscopical appearances are recorded very briefly; merely the words "Les alvéoles pulmonaires sont remplis d'hématies." When this case is compared with some of my cases which were very definitely hæmorrhagic, and in one of which blood

could be squeezed from the bronchioles, it appears to me possible that a further examination of the sections might reveal in their case an earlier stage of the endothelial reaction to be at the bottom of the hæmorrhage. This seems to me especially likely, as the case showed a definitely febrile carditis, with Aschoff's nodules throughout the heart, and there was nothing in the notes to suggest very high venous pressure.

Another point that is worth discussing is whether the pulmonary consolidation in these fatal cases is the same as in the more familiar non-fatal cases. Careful consideration of the signs and symptoms of the two classes has led me to the belief that they are identical. There are obvious differences in intensity, but even the most acute display the same insidious onset and lack of disturbance of respiration up to the point when loss of aerating surface is extreme. In fact most of these pulmonary consolidations would have been missed during life had not my interest in the subject led me to frequent examination of the bases. Transition cases also are reported in the literature. Take, for instance, the small epidemic of six cases described by Cheadle[12] in 1888. In this are particularly noted the lack of cough, expectoration, and respiratory distress, but the inflammatory nature of the consolidation is indicated by a little rise of temperature, and the presence of some fine crepitant sounds on the day of onset.

Not all pulmonary complications of rheumatism are of the insidious type described above. Achard,[7] following Bernheim,[8] has distinguished three forms: acute general congestion, partial congestion, and latent congestion, but he does not particularise very carefully the respective cardiac states of the patients displaying these syndromes. Where high pressure is present in the pulmonary veins it is obvious that an important complicating factor cannot be excluded. My patient (A. B.), who had a fairly high grade of mitral stenosis, was in for so few hours during her fatal illness that no serious observations could be made; but a little more than a year before she had been under observation for a pulmonary complication. This started with bilateral pain, dyspnœa, cough, and cyanosis, and showed scattered râles all over both sides, but on this condition clearing up an apparent consolidation at the left base was left, the respiratory-rate being only 20. It seems to me likely that this left base consolidation was of the same nature as that which killed her a year later, and that the acute generalised signs and symptoms were produced at the onset of the specific rheumatic inflammation by reason of the high pulmonary venous pressure.

There comes now the question as to why the consolidation should so commonly start at the left base and in mild cases be confined to the region. Dr. Robert Hutchison and Prof. Langmead have suggested to me that it is by direct spread from the pericardium, the rheumatic organism having a tendency to transgress anatomical boundaries and spread by contiguity. The former has stated in one paper[6] that he has never found the condition except in association with active pericarditis.

A consideration of my cases shows that an active pericarditis was not always present in association with the consolidation; three out of the six had none. This I think renders the spread theory unlikely. For some time I thought that the pressure of a large heart and the consequent partial collapse of the left lung must be the factor determining the preference for this situation, but consideration of the very different sizes of the hearts in the affected cases has made me abandon this supposition.

My present position is rather to make a suggestion than to state a theory. It is now a well-known fact that the rheumatic reaction processes are most likely to be found in positions exposed to friction. Subcutaneous nodules appear in just those positions where the skin is liable to be rubbed over bony surfaces, and vegetations on the valves usually appear in positions where there is most chafing. I would suggest, then, that the large and rapidly beating heart does, by its local massage of the left lung, make that small difference which determines the seat of election. At the same time I would point out that the acute cases do not show any special predilection for one side, and I think that a careful clinical study of the more chronic cases will show that there has been an exaggeration of the unilateral incidence produced in our minds, probably by the suggestive influence of the collapse theory.

One of the difficulties which must be faced is how with so massive a change in the lung the normal parenchyma can be restored. The answer to this is bound to be speculative, but the remarkable power these endothelial cells have of regenerating new blood cells supplies a hint. In the older books the association of pneumonia and pleurisy with rheumatism was considered to be quite a well-established fact. A. E. Garrod,[9] in 1890, wrote a "Treatise on Rheumatism," in which he devoted a chapter to "rheumatic pneumonia," quoted statistics from a number of earlier authors, and made some very acute observations. Rheumatism then, however, was probably more common in adults and more acute in its manifestation, and, although these observations have great interest and value, it is necessary to cover the ground again and correlate physical signs and symptoms with what we have since learnt of the specific pathology of the condition.

There are other subsidiary questions which my sections serve, I think, to settle. For instance, Letulle, Bezançon, and Weil[10] have advanced a theory that the large multinucleate cells of the Aschoff nodule are derived from the muscle cell of the heart. The sections from my cases go far to disprove this.

Summary.

1. A new type of pathological consolidation of the lungs is described. 2. This consolidation is associated with evidence of active rheumatism elsewhere in the body and usually in the heart. 3. Its most striking feature is an enormous endothelial proliferation, the cells apparently originating from the walls of the alveolar capillaries. 4. The reactive process appears to be identical with that described by Coombs as pathognomonic of rheumatic infection elsewhere, and its specific nature is even more striking. 5. The consolidation may spread through the lungs with great rapidity. 6. There is very little disturbance of the respiratory-rate and scarcely any respiratory distress until the consolidation is enormous. 7. If salicylate of soda is given the temperature is little, or not at all, raised. 8. This type of consolidation probably accounts for the patches of dullness met with at the left base in association with rheumatic carditis and hitherto attributed to collapse from pressure.

In conclusion I should like to express my thanks to Dr. C. D. Tingle, assistant pathologist at the Royal Hospital, for invaluable assistance; to my colleague, Prof. Arthur Hall, for so kindly allowing me to examine the slides of his case, and for his valuable help in other ways; and to the Librarian of the Royal Society of Medicine, who has been indefatigable in helping me to trace references.

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Clinical and Laboratory Notes.

A NEW METHOD OF ADMINISTERING HEAVY METALS.

WITH REFERENCE TO THE TREATMENT OF CANCER.

BY J. LEON JONA, M.D. MELB., M.S. ADEL.

(*From the Physiological Laboratory, University of Melbourne.*)

IT sometimes happens that heavy metals given by the mouth either are not absorbed (cf. Bunge [1]) or produce irritation of the stomach or bowel. The consequent vomiting or diarrhœa causes the loss of a variable amount of the administered metal as well as general effects due to the gastro-intestinal disturbance. When the metals are injected subcutaneously or intramuscularly, local irritation or even death of tissue, with consequent inflammation, necrosis, or sloughing often results. When injected intravenously the metal is either (in all probability) combined with the proteins of the blood and then picked out by the liver and slowly excreted, or a violent effect on the heart or nervous system is produced by the sudden introduction of the toxic metal, and the recipient collapses or dies, according to the dose. So it occurred to the writer that the blood corpuscles might be utilised as a vehicle. Introduced metal-laden corpuscles break down at a steady rate, so that the metal is steadily liberated into the blood, probably as a colloidal compound, and picked out by those tissues having an affinity for it. That a metal so added to a corpuscle is apparently combined with or adsorbed to the envelope of the corpuscle can readily be seen by treating a smear preparation of corpuscles combined with lead, bismuth, copper, or mercury with a solution of sulphuretted hydrogen, when the red corpuscles show a black rim like the tyre of a wheel and the surface of the corpuscle is stippled or stained more or less uniformly black. The great surface-area of the corpuscles—about 600 sq. mm. in 1 c.mm. of blood—provides tremendous scope for medication. (See Tabulæ Biologicæ.[2])

The preliminary experiments were performed on dogs, cats, and human volunteers; the individual's own blood was drawn off into sodium citrate solution, the corpuscles were centrifuged off, washed, combined with the metal, washed twice or three times until the supernatant fluid was free of metal, and then reintroduced intravenously in a saline suspension. In later experiments the blood of one animal was used for preparing the corpuscle-metal combination which was injected into another animal of the same species. In a subsequent series sheep or ox blood preparations were injected into dogs, cats, rabbits, and human beings and were found to produce the same effects as autogenous blood corpuscles. This, of course, made experimentation easier, as it was possible to keep a large stock in an ice-chest and perform a regular series of experiments with a constant preparation.

The animal experiments showed that it was possible to administer intravenously in this way doses of lead, copper, mercury, and other metals three to five times as great as would kill the animal if they were introduced intravenously in ordinary solution under the same conditions. Latterly I have been using lead and bismuth combined in this way for inoperable cancer, but it is too early yet to speak of results.

The ease of preparation, constancy of composition, and stability of the preparation, when properly taken care of, contrast with the difficulty of preparation and preservation of the ordinary solutions of colloidal lead as used at present by Blair Bell and others in cancer work.[3] Various metals and metallic substances have been used, including copper, lead, zinc, mercury, gold, silver, and iodine.

The phenomenon is probably a surface effect of the nature of adsorption, or a specific combination of the metal with some constituent of the envelope of the corpuscle. This is indicated by the fact that the corpuscles take up most of the metal when small quantities are used. Copper was used in these experiments as copper-sulphate solution, and as the dose was increased relatively more and more copper sulphate remained in the supernatant fluid. Similar results were obtained with cupric chloride and with a solution of cupric cyanide in potassium cyanide solution. Owing to the high toxicity of the latter drug, much smaller doses were given and the amount of cupric cyanide in the supernatant fluid was much diminished. After the second washing there was no metal in the supernatant fluid.

Where lead and bismuth were together combined with the corpuscles for the treatment of cancer it was found that the preparation contained: bismuth 4·8 per cent. and lead 2·7 per cent., both lead and bismuth being estimated as metal. It was possible to give a dose which contained 0·24 g. of bismuth and 0·135 g. of lead, but the usual dose was one containing 0·2 g. of bismuth and 0·11 g. of lead. It was repeated every three or four days until three or four doses had been given, and then an interval was allowed.

In the original experiments on cancer in 1924 copper was used. Although life was probably not prolonged, it was made endurable, and in some cases the patient put on weight for a while and ultimately died after only about two weeks' illness without any of the usual wasting. At present bismuth and lead combined are being tried, and it is hoped shortly to have a series on copper and lead combined.

I wish to thank Prof. W. A. Osborne for the use of his laboratories, and Prof. E. Hartung for having carried out the chemical analyses for me.

[1] Bunge, G. von: Physiological and Pathological Chemistry (translated by E. H. Starling), 1902, p. 371.

[2] Tabulæ Biologicæ (ed. W. Junk), by C. Oppenheimer and L. Pincussen, 1925, ii., 460.

[3] W. Blair Bell and co-workers: Brit. Med. Jour., 1926, i., 924.

AN UNUSUAL CASE OF ACUTE INTESTINAL OBSTRUCTION.

BY JAMES FANSTONE, M.D. LOND., D.T.M.,
AND
GERALD GOLDEN, M.B., B.S. LOND.

FÆCAL impaction is mentioned in text-books of surgery as a cause of acute intestinal obstruction, but it is so rare at home that the description of the following case may be of interest. It is an extreme example of a disease which is quite common in the interior of Brazil—namely, an extraordinary sluggishness of the large bowel. An evacuation at intervals of ten days is considered no sufficient reason for seeking medical aid, while we have seen patients who have passed more than 40 days without action of the bowels.

The case is that of a married woman of 29, who was brought to us in September, 1926. She had not suffered from any serious illness previously, but for 12 years had complained of increasing irregularity of the bowels. Eighteen days before her arrival she had eaten enormous quantities of a fruit which resembles the grape, but has larger and harder stones. Since then she had had no action of the bowels, and had suffered much colicky abdominal pain.

On examination she was found to be five months pregnant with her first child. It was difficult to feel the uterus owing to the enormous abdominal distension, which was, however, most marked laterally. A huge fæcaloma occupied the entire descending and the left half of the transverse colon. Except at the proximal extremity, this mass was stony hard, and palpation caused much pain. A previous diagnosis had been made elsewhere of transverse presentation! It was impossible to feel the mass by rectal examination. There was no fever and the pulse-rate was 90. Two large enemas were administered but failed to produce either fæces or flatus.

At operation the fæcal mass was found to be between 5 and 6 in. in width. No cause could be found for the obstruction; the pelvic colon below the mass seemed to be quite normal to sight and palpation. A colostomy was made by introducing a Paul's tube into the transverse colon, just proximal to the mass. For some weeks after operation attempts were made to evacuate the impacted mass by enemas of all kinds, but without success. Instead there was a steady increase of pain and tenderness localised to the left iliac fossa, associated with fever and emaciation. These symptoms persisted for three months.

The next event was the birth, without serious difficulty, of a healthy eight-months child. After labour the bowels opened naturally, with the evacuation of hard masses, in which fruit-stones were conspicuous. At this time about one-third of the fæcaloma came away, with temporary relief of pain and fever. No further evacuation occurred, and pain and fever returned during the puerperium. The symptoms were very severe indeed, and lasted about six weeks. During this time the lower abdomen was very tender to palpation, especially on the left side. Micturition was frequent and painful. By vaginal examination, a large inflammatory mass could be felt in the left fornix. After all symptoms had subsided completely, the fæcal mass was finally and rapidly evacuated by the introduction of a saturated solution of magnesium sulphate into the distal limb of the colostomy.

In April, 1927, the abdomen was reopened. The pelvic colon was found to be only a few inches in length, was narrowed, very hard and fibrous, and united by recent adhesions to the body of the uterus. Above this stricture the descending colon was enormously dilated and somewhat hypertrophied. As the stricture reached the upper end of the rectum, any attempt at resection and anastomosis was out of the question. The colostomy was therefore excised and the free extremities anastomosed side to side. This was followed by a complete return to health. The bowels continue to act regularly as a result of the copious daily use of magnesium sulphate.

Annapolis, Brazil.

A NOTE ON
MULTIPLE SUPERFICIAL ULCERS OF THE SMALL INTESTINE.

BY K. KANAGARAYER, L.M.S. SINGAPORE, D.T.M. BENGAL,
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AMONG ulcers of the small intestine, the single duodenal ulcer, the multiple typhoid ulcers of the ileum and lower alimentary tract, and tuberculous ulcerations have all been classified and descriptively labelled. In 3000 autopsies during the last four years I have found, in three cases, an ulceration of the small intestine which fails to conform to any of those three recognised types. As attention has been directed to a similar condition in a case reported by M. Scott and J. B. Cleland,[1] the post-mortem findings in these three cases are here briefly recorded.

Reports of Cases.

CASE 1.—On Jan. 26th, 1925, the body of a Tamil, said to have committed suicide by hanging, was brought to the District Hospital, Kuala Lumpur. Its condition suggested that a chronic wasting disease had driven him in desperation to take his life. At autopsy the only lesions were a series of superficial ulcerations in the small intestine extending from 1 inch from the duodeno-jejunal flexure to 4 feet from the ileocæcal junction. There were four or five ulcers in each foot of intestine, all running transversely, and the majority involving the entire circumference of the bowel. Some of them were quite narrow, others ¼–½ inch in diameter. The base was fairly smooth, and the edges only slightly raised. The peritoneal surface was not thickened in most cases, but a few showed slight puckering. In their distribution, serpiginous extension in the transverse axis of the bowel, and puckering of the peritoneal surface, they almost resembled tuberculous lesions, except that there was less puckering, edges and bases were less ragged, and tubercles on the peritoneal surface were absent. There was no evidence of tubercle in the abdomen or elsewhere. Smears made from scrapings of the bases and edges of ulcers, and of their peritoneal surface, showed no tubercle bacilli. Unfortunately, the ulcers were not histologically examined, but in view of the findings in the next two cases, it is probable that the histological picture would have been similar to that described below. A history of pain in abdomen and diarrhœa of four months' duration was obtained from the brother.

CASE 2.—On July 28th, 1927, a young male Tamil was admitted to the hospital with complaint of passing loose motions, five to seven times a day, without blood or mucus, for about a fortnight. He died on August 10th and autopsy revealed only nine small superficial ulcers in upper part of jejunum. A few ulcers were circular; but most of them were oval with their longer diameter in the transverse axis of bowel. The peritoneal surface of these ulcers was puckered. No protozoa or acid-fast bacilli were found in smears. Cultures yielded coliform organisms. The rest of the alimentary canal was normal, and no evident cause of death other than the ulcers was noted. The body was emaciated, and it is likely that the illness was of longer duration than indicated by the history. Sections of the ulcers showed chronic inflammatory changes with loss of the mucous and submucous coats.

CASE 3.—A Tamil, aged 30, was admitted to the hospital on June 19th, 1927, suffering from chronic urethritis, and progressive emaciation and diarrhœa. The Wassermann reaction was negative. Intestinal tuberculosis was suspected. He died on August 20th, and autopsy revealed transverse ulcerations along the whole length of the small intestine extending from the lower third of the duodenum to 2 feet from the ileocæcal junction, with four to five ulcers in each foot of intestine. The description already given to those in Case 1 applies equally to these. Sections showed no histological evidence of tuberculous condition. There was loss of mucous and submucous coats and evidence of chronic inflammation.

These three cases present an unusual type of ulceration of the small intestine. The ulcers were superficial and showed a tendency to healing and scarring. No explanation of the genesis of these ulcers can at present be given. So rare is the condition that a diagnosis antemortem must be extremely difficult. Radiographic examination of the small intestine might help in diagnosis. The anatomical resemblance to tuberculous lesion suggests that the ulceration extends transversely round the gut by following the course of lymphatics and blood-vessels; but the lymphoid nodules do not appear to be involved, as they are in typhoid and tuberculous ulcers.

[1] Medical Journal of Australia, 1927, i., 718.

DONATIONS AND BEQUESTS.—Sir Henry James Hall, Gloverswood, Charlwood, Surrey, left £1000 to St. Dunstan's Hospital for Blinded Sailors and Soldiers, and £500 to the London Association for the Blind.—Mr. Frank Sussum, of Cambridge, left £1000 to Addenbrooke's Hospital, Cambridge.—Mr. Ramsay Paxton, of Sunderland, left £700 each to Sunderland Infirmary and Sunderland Orphan Asylum.—Among other bequests Mr. F. L. Heyn, J.P., of Craigavad, County Down, left £1000 to the Royal Victoria Hospital, Belfast, to name two beds, one to be called the "Frederick L. Heyn and Helen B. Heyn Bed," and the other the "F. L. Heyn Head Line of Steamers Bed"; £250 to the Belfast Maternity Hospital; £250 to the Society for Providing Nurses for the Sick Poor of Belfast; £200 each to the Samaritan Hospital, Belfast, and the Ulster Hospital for Women and Children, Belfast.—Under the will of Sir Edwin Evans, J.P., of Battersea, the Bolingbroke Hospital, Wandsworth Common, S.W., will receive £1000 for general purposes and the Battersea General Hospital and the Royal Blind Pension Society of the United Kingdom £250 each.—Mr. Samuel Kidd, of Derby-road, Farnworth, near Widnes, left £1000 each to the School for the Blind, Hardman-street, Liverpool, the Royal Infirmary, Liverpool, the Eye and Ear Infirmary, Liverpool, and the Ethel Gossage Home, Farnworth Branch.—Mr. Matthew Turbitt, of Birkdale, Southport, left £1000 stock to the Southport Infirmary and, subject to a life interest, £1000 each to the Imperial Cancer Research Fund, Dr. Barnardo's Homes, the Church Army, the National Lifeboat Institution, and the North of England Children's Sanatorium at Southport. After other bequests the ultimate residue of the property will be divided between St. Dunstan's Hostel for the Blind, King George's Fund for Sailors, the Society for the Prevention of Cruelty to Children, the Royal Association in Aid of the Deaf and Dumb, the Southport and District Deaf and Dumb Mission, and the Southport and Birkdale Provident Society.

Reviews and Notices of Books.

SIMPLE GOITRES.

By R. MCCARRISON, C.I.E., M.D., D.Sc., LL.D., F.R.C.P., Associate Fellow de l'Académie de Médecine, Paris; Lieut.-Colonel, I.M.S.; Pasteur Institute, Coonor, S. India. London: Baillière, Tindall and Cox. 1928. Pp. 106. 15*s*.

THE subject matter of a report by Colonel McCarrison to the International Conference on Goitre held at Berne in August, 1927, has been published in the form of a monograph and has been amplified by an introduction. A series of 143 excellent illustrations follow the report, and, if studied in the order in which they are arranged, tell their own story of the genesis of simple goitres. Three types are discussed: the adeno-parenchymatous or chronic hypertrophic goitre, the diffuse colloid type, and the lymphadenoid type. The similarity of these three goitres is confined to the thyroid swelling which is manifest in them all, even as the exanthemata have in common only the pyrexia which is their most prominent symptom. The adeno-parenchymatous and diffuse colloid goitres are endemic types and differ in their epidemiology, ætiology, and pathology; both may occur sporadically. Adeno-parenchymatous goitre occurs in mountainous regions, the diffuse colloid goitre in lowland regions and at or near the sea coast. Their geographical limits may overlap and they may occur together in the same locality. The first-named type is considered to be a true hypertrophy with the thyroid constantly straining to satisfy the needs of the tissues for its active principles but just falling short of doing so. Sufferers generally show evidence of hypothyroidism. This is essentially a place disease, and from time immemorial has been associated in its origin with water-supply. Two theories as to its causation have survived from amongst many promulgated, the iodine deficiency theory and the infectious or toxic theory. Colonel McCarrison is of the opinion that the truth may lie in a blend of the two, but it is rather difficult to see how such different conceptions could be made to overlap.

We have little precise knowledge as to the geographical distribution, epidemiology, ætiology, and biochemistry of diffuse colloid goitre. Its cause is probably to be sought in factors which interrupt the normal cycle of the thyroid gland's activity at the stage of colloid storage. It is most prevalent in children round about the age of puberty, and it progresses with remissions for from three to five years and then regresses. Iodine may play some part in its production, but is not the only factor involved. Thyroxin given by the mouth may have no effect, but the same drug administered intravenously rarely fails to cure the condition. The lymphadenoid type of goitre is not endemic. It is a hypertrophic reaction of a physiologically insufficient organ, with which is associated a preponderance of lymphocytic aggregates and fibrosis in the gland. It can be produced experimentally in rats by dietetic deficiency. McCarrison considers that the basal factor in the causation of this type of goitre in man also is a diet deficient in vitamins of the A, B, and C classes. This, however, has still to be proved. He considers that it is not related to iodine deficiency since the addition of iodine to the food neither prevents nor cures it.

This monograph will be of considerable value to those interested in thyroid disease, especially in that it directs attention to the importance of toxic and dietetic factors in the genesis of these conditions. It should also do something to counteract the modern tendency to the indiscriminate use of iodine in the prophylaxis and treatment of all forms of simple goitre.

THE SPECIES PROBLEM.

By G. C. ROBSON. Edinburgh: Oliver and Boyd. 1928. Pp. 283. 15*s*.

THE Keeper of the Mollusca at the British Museum has written an interesting and suggestive book. The first part discusses the criteria on which "species" of animals and plants may be separated from one another and represents well the modern point of view that habits, food, and such physiological characters must be taken into account equally with morphological structure. A species is a species not so much because it has a unique anatomy, but because it occupies a unique niche in its relations to the rest of animate nature. The second, and larger part, discusses the evolutionary divergence of species, and explores the various suggestions which have been made in the light of all the knowledge which has accumulated since Darwin. It is stimulating and provocative and reaches no conclusions. There is a useful bibliography and a poor index.

ENDOCRINOLOGY.

Internal Secretions and Metabolism in Infancy and Childhood. By FRITZ B. TALBOT, A.B., M.D., Clinical Professor of Pediatrics, Harvard Medical School. Supervising editor: R. S. HAYNES, Ph.B., M.D., Clinical Professor of Diseases of Children, College of Physicians and Surgeons (Columbia University), N.Y. London and New York: D. Appleton and Co. 1928. Pp. 178. 16*s*.

THIS is the thirteenth volume of a series of monographs on clinical pediatrics which are written primarily for the general practitioner. Both the authors are men of great experience in this subject and the work is authoritative. The purpose of the volume is to outline in simple terms those fundamental principles of metabolism which form the basis of modern clinical medicine. Twenty years ago most students were taught that medical therapy was based principally upon clinical observations, bacteriology, and post-mortem examinations. They learnt in great detail the symptoms and signs of the various diseases of nutrition and the lesions which were characteristically produced by each disease, but they knew very little about the abnormal physiology associated with the different syndromes. In the last two decades, however, physiologists and chemists have so increased our knowledge of the normal and abnormal functions of the body that our conception of disease has been greatly modified. The authors of this monograph have considered the subject from the most modern standpoint and have included an account of recent experimental work. The work is divided into five chapters. In the first of these the fundamental metabolic processes of childhood are fully discussed, and much useful information is given about the normal variations both of metabolism and growth which serve as standards of comparison in the following sections. In the second chapter pathological variations in metabolism are dealt with; a clear account is given of acidosis and alkalosis. An outline of ductless gland dystrophies is set out in the third chapter, only such data being included as have a definite experimental basis. The fourth chapter gives a description of the deficiency diseases of childhood, notably rickets and scurvy, while the fifth is devoted to such abnormalities of growth and development as infantilism, mongolism, and obesity. Many useful hints as to the treatment of these various conditions are incorporated. An excellent series of diagrams and photographs will be useful in helping the practitioner in differential diagnosis; the X ray photographs illustrating the various bone diseases are particularly good. The monograph can be cordially recommended.

Hormone und Inner Sekretion. By Dr. FRITZ LAQUER, Privatdozent an der Universitat Frankfurt A.M. Dresden und Leipzig: Verlag von Theodor Steinkopff. 1928. Pp. 136. M.8.50.

THE rapidity with which masses of facts and observations accumulate in the literature of internal secretions makes it difficult for one observer to follow even a limited aspect of the subject. Any attempt to verify all the results of the enormous number of workers in this field is out of the question, and each

worker can only try to correlate his own findings with those of well-accredited laboratories. Dr. Laquer has gathered together much of the literature of hormones and internal secretions which has grown during the last 12 years; over 1200 references have been collected. He makes little effort to supply a critical survey: in the matter of physiological explanations of the actions of different hormones the reader is at liberty to choose whatever theory pleases him most without much guidance. With regard to clinical data, however, the results obtained by serious workers of different nationalities are substantially the same. The active hormones produce effects which vary only in degree in the hands of different observers. When physiologists and biochemists attempt to explain the modus operandi of the hormones the most diverse opinions are offered, and fundamental disagreement still exists.

Dr. Laquer does not attempt to resolve these differences, and his book will be of value to the research worker in that the literature is clearly summarised and references are given to articles in the less well-known special journals which may have escaped attention.

THE GREAT PROBLEM AND THE EVIDENCE FOR ITS SOLUTION.

By GEORGE LINDSAY JOHNSON, M.A., B.C., M.D., F.R.C.S., F.R.P.S., F.R.S. Italy. With a Foreword by Sir A. CONAN DOYLE. London: Hutchison and Co. 1928. Pp. 380. 18*s*.

PUBLIC interest in spiritualism—a general name for the phenomena whose study constitutes "the great problem" attacked by Mr. George Lindsay Johnson—is reflected in the lay press and in a profuse literature which sometimes appears associated with the name or under the imprimatur of persons whose qualifications should give authority to their opinions. The object of Mr. Johnson's work, which has received the euology of Sir Arthur Conan Doyle, is "to collect all the evidence at our command, and to endeavour to convince the reader of the existence of a future life." The first part of the proposition is fulfilled by the collection and collation of a vast assortment of dreams and stories of apparitions, examples of clairvoyance and telepathy, spirit vocalisations and photography, and automatic writing; past and present beliefs and traditions being put under contribution, we have an index of proper names occupying more than 800 lines. In a chapter headed "Evidence of a future life from the miracles of the Bible, together with modern phenomena of a similar nature," many unusual cases of recovery from illness are given, but it is difficult to understand how the occurrence of healing, apparently brought about by mental processes, can be used as evidence of survival in any partly materialised form, and it is doubtful whether anyone, unless he is already a confirmed believer in spirit interference, will be impressed by the reasoning. Endeavouring to explain certain difficulties of the non-believer in spiritualism the author replies to his question, "... Why is it that everybody cannot get into touch with their friends on the other side?" by saying that "The reason is quite simple. In order to receive messages from the spirit world it is essential that a psychic or medium be present"; here, again, none but the converted will be satisfied with the answer. As an example of painstaking research in collecting stories of the "marvellous" the book is interesting, while at the same time it exhibits the kind of proof on which belief in so-called survival is based.

Even if the phenomena of the séance room, and the stories of supernormal occurrences be accepted, it does not follow that they are to be explained by spiritualistic agency, while there can be no denial that the belief in the sequence has opened the door to deception, sometimes of the most gross kind. It is necessary to glance only at the advertisements of some of the publications connected with the spiritualistic movement to realise this. In juxtaposition with announcements of services in "temples," "sanctuaries," and "churches," we have announcements from palmists, astrologists, and fortune-tellers, seductively brought before the public eye, while the vendors of unknown powers of diagnosis, of cures for consumption and cancer, of "female corrective herbs," of electric treatments, and galvanic belts, find a large public through these media, to judge by the amount of space which some of the advertisers are able to afford. Such being the associations of spiritualism as shown by its recognised press, the answer is supplied to the frequently reiterated complaint by spiritualists that their cult is ignored or ridiculed by science.

CLINICAL DIAGNOSIS BY LABORATORY METHODS.

Sixth edition. By JAMES CAMPBELL TODD, Ph.B., M.D., Professor of Clinical Pathology, University of Colorado School of Medicine; and ARTHUR HAWLEY SANFORD, A.M., M.D., Professor of Clinical Pathology, University of Minnesota. London and Philadelphia: W. B. Saunders Company. 1927. Pp. 748. 28*s*.

"Todd" has long been known in this country, and "Todd and Sanford" is assured of an equal popularity. This is a book which is of particular value to the student, for the number and the excellence of the illustrations, the clarity of the language, and the short, but concise, notes on the indications for the applications of various tests and the interpretation of the results. The present edition has been brought thoroughly up to date, and all new procedures of clinical pathology as deserving admission, such as the Kahn test, the technique of duodenal intubation, and the tests of liver function, find place in its pages. Altogether, an excellent book.

MICRO-METHODS.

Mikromethodik. Quantitative Bestimmung der Harn-, Blut- und Organbestandteile in kleinen Mengen für klinische und experimentelle Zwecke. By LUDWIG PINCUSSEN, Direktor der biochemischen Abteilung des Städt. Krankenhauses am Urban in Berlin. Leipzig: Georg Thieme. 1928. Pp. 200. M.6.

THIS book, which now appears in its fourth edition, has been enlarged and improved. Opening with sections on general principles on the use of the colorimeter and on nephelometric methods, the author proceeds to give full experimental details for the determination of the constituents of urine and blood by approved micro-methods, many of which have been elaborated or improved by himself. In addition there are sections devoted to the estimation of the ash constituents of fæces or of tissues, and to the gasometric examination of blood by means of a modified Barcroft method. The book is clearly written and forms a handy compendium of micro-methods, suitable for clinical or experimental purposes, which can be carried out without the acquisition of elaborate apparatus or the use of a micro-balance.

TO-DAY AND TO-MORROW.

Metanthropos, or the Body of the Future. By RONALD CAMPBELL MACFIE, M.A., M.B., C.M., LL.D. London: Kegan Paul, Trench, Trübner and Co., Ltd. New York: E. P. Dutton and Co. 1928. Pp. 96. 2*s*. 6*d*.

Dr. Campbell Macfie adds a volume to the well-known To-day and To-morrow Series which should certainly be read by a large public, for the number of persons now intelligently interested both in anthropology and physiology is very large. We may conceive that the last and most important chapter of this little book will irritate many of these, and some of the general deductions may be challenged, but despite the drastic commentary upon one side of society

contained in the following passage, the author's message is cheerful. "If love," he writes, "in the sense of strong physical and spiritual attraction between a man and a woman, have even temporarily weakened; if men no longer are drawn to women by their health—by their full breasts, and luxuriant hair, and well-formed limbs, and red lips, and fresh complexions, and feminine psychology—if nowadays women are so camouflaged with paint and powder and so attenuated by the decrees of fashion that there is little possibility of distinguishing the healthy and wholesome from the unhealthy and unwholesome—if men have grown so accustomed to paint and powder as to lose the love of the healthy and fresh—if sexual selection is no longer eugenic and no longer a matter of deep personal affinity—if men and women through modern dances and plays become sexually bláses—if the best men and women marry late and have small families—if religion and morality are out of fashion—if these things are so and in so far as they are so, the race is suffering and must suffer for perhaps more than one generation." These Juvenalia epitomise much which the author has to say, but none the less he comes to the conclusion that the majority of men and women are not yet touched by decadence and that the Anglo-Saxon stock with its mixture of Nordic and Celtic blood is so stable and so good that there is no fear of any lasting deterioration.

PHYSIOLOGY AND MEDICINE.

Pathological Physiology of Internal Diseases: Functional Pathology. Fourth edition (revised). By A. W. HEWLETT, M.D., B.S. late Professor of Medicine, Stanford Medical School. London and New York: D. Appleton and Co. 1928. Pp. 787. 35*s*.

THE advances in recent years of experimental physiology and particularly of mammalian physiology have thrown new light on the causation of disease and furnished new lines of treatment. Moreover, physiology has brought new methods of diagnosis to the clinical laboratory. The benefit has not been wholly one-sided, but attempts to correlate medicine and physiology in text-books have for the most part dwelt on the debt of medicine to physiology. This work is no exception. It was originally written by the late Dr. A. W. Hewlett, who began his medical career as a physiologist, later becoming a professor of clinical medicine, and it has recently received extensive revision, as a mark of appreciation to the author by ten of his medical colleagues. The book, in its present form, makes a special appeal to clinicians. Historical references are scanty, but a generous bibliography is supplied. Certain of the views on immunity here set out are already superseded, at least in this country, in favour of physico-chemical hypotheses, but, in general, the book may be accepted as quite up to date.

Précis de Physiologie. Seventh edition. By MAURICE ARTHUS, Professor of Physiology at the University of Lausanne. Paris: Masson et Cie. 1928. Pp. 1152. Fr.70.

A TEXT-BOOK of a thousand pages is not the prevailing notion of a précis, but evidently the bulk of this volume has not deterred medical students from buying it, since it has attained a seventh edition. The work differs in three respects from text-books of similar size in our language. It is more narrowly confined to the exposition of function, the author expressly avoiding the discussion of physiology from the point of view of physics and chemistry. Experimental technique is not described; for example, "tambours" appear in diagrams where "piston recorders" would be used in this country. Lastly, when results of recent researches are still controversial, these are omitted; these omissions may save the student's time but, we believe, only at the expense of loss of stimulation. More prominence is given to the medical standpoint than is usual in our text-books; thus, body temperature—a subject of great clinical importance—is fully discussed. A useful chapter is included on anæsthesia. British readers will find much of interest in this book.

THE PRINCIPLES OF INFANT NUTRITION.

By K. H. TALLERMAN, M.D., M.R.C.P., and C. K. J. HAMILTON, B.M., M.R.C.P. London: William Heinemann, Ltd. 1928. Pp. 183. 10*s*.

THE object of this book is to discuss the principles underlying infant nutrition, and to point out their application to the practice of infant feeding rather than to advocate any particular method. The authors have succeeded in giving a readable presentation of the physiology and biochemistry of nutrition in infancy. The relative advantages of various methods of feeding are discussed with impartiality, but the authors' interpretation of physiological theories disposes them to give preference to simple modifications of milk with added carbohydrate and low fat-content. Whole milk feeding is discouraged; percentage feeding is regarded as unnecessary. The reason for these judgments, which are probably in accord with the views of the majority of authorities in this country, are clearly explained. The authors are opposed to the use of citrate and of alkalis in general, and are convinced of the advantages of acid milks. The book is of convenient size, and each chapter contains a useful list of references. It may be recommended for the use of senior students and of practitioners who wish to obtain a concise account of modern teaching.

PSYCHE MINIATURES.

A Symposium of Culture. By G. ELLIOT SMITH, D.Sc., Professor of Anatomy in the University of London; BRONISLAW MALINOWSKI, D.Sc., Professor of Anthropology in the University of London; HERBERT J. SPINDEN, Ph.D., Peabody Museum, Harvard University; and A. GOLDENWEISER, Ph.D. Pp. 89.

The Alchemy of Light and Colour. By OLIVER L. REISER, Assistant Professor of Philosophy in the University of Pittsburg. Pp. 86.

Intelligence and Mental Growth. By CLAUDE A. CLAREMONT, B.Sc. Lond. Pp. 138.

The Standardisation of Error. By VILHJMUR STEFANSSON, M.A., LL.D. Pp. 110.

London: Kegan Paul, Trench, Trübner and Co., Ltd. 1928. 2*s*. 6*d*. each.

As will be seen from the above titles a large range of knowledge is covered in these four little books of the Psyche Miniature Series, and it is given in so brief a form that further condensation as a review is impossible. The Symposium of Culture, for example, may be regarded as the abstract of a review of its own subject from four different angles of view, a lucid preamble by Prof. Elliot Smith setting out the controversial points in respect of the diffusion of social knowledge. Prof. Reiser, in discussing the phenomenon of colour, shows how the ingenuity of the scientist in overcoming limitations has brought about the position that no one can predict what the future may hold in store. Starting with the difficulties which have always presented themselves to the ordinary observer confronted with the differing views which the psychologist may hold in respect of colour as an attribute, or as an element in consciousness, he discusses the chemical and biochemical bases of colour and closes with a section, not at all easy to follow, in which he attempts to bring out the nature of the interdependence between consciousness and chemistry. Mr. Claremont's little book makes far simpler reading, partly because a well-written preamble prepares us for the chapters which follow, and partly because he has a real gift for illustrating his thesis by simple analogies. The chapter on intelligence and instinct forms a good example of

his ability to state in clear language exactly what he means, and no one can read it without acquiring a valuable lesson in what may be termed psychological grammar.

Dr. Stefansson is gay; the following sentences with which the second part of his little book commences gives a good idea of his respect or disrespect for the discernment of the public. "The most striking contradiction of our civilisation is the fundamental reverence for truth which we profess and the thorough-going disregard for it which we practise. . . . God and truth have from the earliest times been the two ideas that have commanded the greatest reverence . . . philosophers have discussed at great length whether God is good, they have never discussed whether truth is good." Whereupon the author starts to ask if there be any sound reason why truth should be exempted from that fundamental scrutiny to which even the gods have had to submit. It is, of course, obvious that the same question may be asked of the same people and receive entirely different replies, each of which may be true, the variants being due to the fact that the answers have been given in accordance with the varying implications contained in the question, although not put into words. On this ground, by itself, we may agree with the author that, like religion, truth is neither good nor bad; but the examples which he adduces in order to come to the conclusion make very agreeable reading.

MEDICAL AND ALLIED TOPICS IN LATIN POETRY.

By HENRICH OPPENHEIMER, D.Lit., LL.D., Ph.D. Lond., M.D. Heidelberg, M.R.C.P. Lond., Barrister-at-Law. London: John Bale, Sons and Danielsson. 1928. Pp. 445.

IN a sad little preface Dr. Oppenheimer gives as the origin of this book a certain enforced leisure which fell upon him during the period of the war owing to his unlucky position as an enemy alien—in his own words "an innocent victim of social and 'horribile dictu' to some extent of professional ostracism." Accordingly, the author sought and found comfort in the company of the classical writers, and the result is an interesting collection of passages, contained in some 20 well-known Latin poets, all being relevant to medical knowledge. These passages he has arranged according to their subject matter, providing explanatory notes and English translations, some of which are quite familiar. Where the versions are metrical he gives the correct attributions, but with regard to both English and Latin texts he admits occasionally having taken certain liberties, when a variant reading seemed to bring out better the significance of a passage; as the exact alterations made are not indicated this seems rather a daring proceeding. As might be expected, the majority of the quotations come from well-known authors of the last century B.C. and the first 60 years of the Christian era, a period which includes Lucretius, Virgil, Ovid, Horace, Catullus, Martial, and Juvenal—the quotations from the last four being extremely numerous. The two older playwrights, Plautus and Terence, are also freely drawn upon, and all the passages extracted from this wide range of reading are arranged under a subject-index, so that citations having reference to medicine, surgery, and obstetrics are grouped together, while separate sections are devoted to various special diseases, to biology and physiology generally, to sociology, materia medica and toxicology, neurology, insanity, and dietetics. The result is a really interesting book, which although in no sense a medical history, none the less throws a remarkable light upon the medical practice and medical superstitions of the past, especially upon those of imperial Rome. An interesting little chapter, entitled the Medical Register of Poets, gives an alphabetical list of the physicians who are mentioned by name in the works of the various authors consulted, and by this register we are reminded how frequently was the medical profession the object of Martial's biting criticisms.

JOURNALS.

ACTA PÆDIATRICA. Vol. VII., 1928.—Supplement 2 comprises the proceedings of the Fourth Scandinavian Pædiatric Congress. Prof. S. Monrad reviews the subject of congenital pyloric stenosis from his experience of 223 cases. He holds that the essential defect is a congenital hypertrophy and that this is not secondary to spasm. He has found medical treatment as efficacious as surgical.—Dr. H. von Willebrand favours operative treatment of pylorospasm in all but the mildest cases.—Dr. L. Kena-Apajalahti gives an account of the histological appearances of the brain of a cretin child. These were of the nature of an agenesis rather than a failure of subsequent development, and corresponded closely to what is found in simple primary amentia. He suggests that the cerebral defect in cretinism is primary, i.e., an accompaniment rather than a result of athyroidism.—Prof. A. Yllpö discusses the relative merits of carbohydrate and protein feeding in the treatment of infantile intoxications, and expresses his decided preference for the latter.—In a paper by Dr. O. Utter attention is drawn to the frequency with which an alimentary saccharosuria, in the absence of glycosuria, occurs in infants. The increasing tendency to use cane sugar in the artificial feeding of infants gives added importance to this occurrence. He summarises the results of his investigations on the various factors (concentration, alkalinity, and fat content of the feeds) which seem to influence the excretion of saccharose.—Dr. A. Lichtenstein discusses the ætiology of scarlet fever, and the immunity of the new-born to this infection. He considers that the evidence afforded by this immunity is compatible with the view that scarlet fever is a manifestation of anaphylaxis.—Prof. E. Bloch describes the clinical features of a series of cases of cœliac disease. He was unable to find in them any evidence of avitaminosis. Two of his cases showed typical tetany; ultra-violet irradiation cured the latter but aggravated the intestinal disturbance. He suggests that in this disease tetany may be the result of fixation of calcium by the soaps formed in the stools.—Dr. C. Friderichsen gives an account of a series of cases in which intractable and fairly localised muscular pains occurred, with some degree of paresis. Some of the cases were children in the third year, and in them the symptoms gave rise to suspicion of muscular "growing pains." In all of them there eventually appeared some evidence, clear or equivocal, of a scorbutic condition. Taken in conjunction with the histological changes found by Höjer in experimental scurvy in guinea-pigs, he suggests that these observations yield evidence of a "pre-scorbutic myopathy," which may be present in a latent stage of scurvy and may simulate subacute rheumatism.—Dr. Knut Wejdling discussed some of the factors in the pathogenesis of spasmophilia. He thinks that the most important one is the electrostatic condition of the tissues, and believes that estimation of the potassium content of the blood is of greater value than the calcium content.

Supplement 3 consists of a monograph by Dr. C. W. Herlitz on the regulation of the blood-sugar in healthy infants and in those who exhibit signs of the exudative diathesis, particularly of eczema. Series of experiments are described and their interpretation is discussed at length. Among other conclusions reached are the following. In infants with fresh cutaneous eruptions of less than two weeks' duration the fasting blood-sugar value was higher than in normal infants or in those with long-standing eruptions; the alimentary blood-sugar curve reached a higher maximum but its return to the normal was not delayed. The increase in tone of the vegetative system—particularly in the liver—which is associated with the alteration in carbohydrate metabolism, he regards as the result, and not the cause, of the cutaneous eruption.

THE LANCET.

LONDON: SATURDAY, JULY 7, 1928.

LOCAL GOVERNMENT REFORM.

BIG changes, affecting the health services of local authorities throughout the country, flow from the proposals in this year's budget for revising the incidence of rates upon agriculture and industry. It was easily realised that the Chancellor of the Exchequer could not exempt agricultural land and agricultural buildings from rates and could not grant a large relief to industrial hereditaments without providing from the national finances some compensation for the loss of rating power which the local authorities would feel. But it could hardly have been so readily foreseen that the revision of the financial relations between the Exchequer and the local authorities would involve the decision to transfer (as provisionally proposed in 1926) all poor-law functions to the county councils and county boroughs.

It has, of course, been long admitted that the present poor-law unions, set up in 1834 under a scheme based on the local market towns and the then existing means of access thereto, have ceased to form the ideal arrangement—at any rate, for medical purposes. As the Government's white paper (Cmd. 3134) points out, at present every rural union in the country has institutions which, with the decline in the number of persons institutionally relieved in rural areas, are seldom kept full. Their facilities for medical treatment cannot economically be modernised. Meanwhile other local authorities have been established which are charged with the duty both of preventing disease and of treating the sick. Between the functions of these newer authorities and those of the poor-law guardians there is overlapping. If and when the poor-law is transferred from the guardians to the county and county borough councils, there will be a chance to eliminate this overlapping, to make a better classification of the sick, and to provide more economically the institutional facilities for which the demand is progressively increasing. In its application to London the new policy means the abolition of the Metropolitan Asylum Board and the transfer to the London County Council of the services which the Board at present maintains. The cost of poor relief being spread over the County of London through the county rate, the Metropolitan Common Poor Fund (the cause of so much political controversy and the object of so much improvisation in recent years) will also be abolished.

Among the existing Exchequer grants which the new plan will discontinue all over the country are the percentage grants in aid of health services—i.e., for tuberculosis, maternity and child welfare, welfare of the blind, venereal diseases, and mental deficiency. When local authorities no longer receive these grants, a new annual grant in aid of revenue will be substituted for the first quinquennial period. The formulæ of ascertainment and apportionment are intricate and will require careful examination by those who possess the necessary actuarial qualifications. In broad outline the Government plan should help the poorest areas which, under the percentage grant system, could least afford to maintain an adequate standard and yet received the least assistance from national funds. Thus the rating relief, which the Government claims to be giving to productive industry by this year's budget, is found to be merely one step in big changes in the machinery and finance of local government. The programme appears to be far-sighted and shows evidence of a logical coördination which has not always been a feature of changes in English administration.

THE CONTROL OF DIPHTHERIA.

WHEN BEHRING made his famous experiments on passive immunity he was lucky enough to choose one of the few organisms which arouse great antitoxic powers in the blood of inoculated animals. His results in the treatment of diphtheria were therefore remarkable—so remarkable as to encourage a hope that all bacterial infections would meet their match in the new curative sera. Certainly there seemed no doubt that diphtheria was conquered, since by effective treatment of every case the spread of the disease must necessarily be checked. But with the passing years these hopes have not been realised, and the revolution in therapeutic measures has by no means abolished the necessity of using them. The incidence of diphtheria not only remains high, but, in London, has for many years been steadily rising, whilst the case-mortality has shown an alarming increase in Germany and other countries where serum treatment has long been employed as a routine. Much of this failure is, of course, due to delays before the remedy is administered, but as medical men have been taught for a generation that early treatment is essential, and the public has been informed incessantly of the need for early diagnosis, little immediate improvement can be expected in this direction. We cannot avoid the conclusion that current methods will not further reduce the mortality among serious cases, and that merely curative measures are not going to control the incidence of the disease by themselves.

Both in the United States of America and in Germany the greater prevalence of diphtheria has been associated with unusual malignancy. The symptoms include glandular enlargement and periglandular œdema with foul-smelling faucial deposits and discharge from the nose and throat, and there is commonly severe toxæmia, cardiac paralysis, renal failure, and early death. Fatalities, it is recorded, have occurred despite administration of antitoxin even within the first 24 hours, and this absence of the usual response to treatment has sometimes suggested that the clinical condition was dominated by a secondary streptococcal infection. Successes have been reported from the combined use of antidiphtheritic and antistreptococcal serum, but its efficacy as a routine measure is still in dispute. Although we in this country have enjoyed relative freedom from severe infections of the kind, experience of the malignant form has been recorded in certain towns; in Bristol, for example, Dr. D. S. DAVIES, the late medical officer of health, reported that the years 1919 to 1926 were characterised by an increase in the severity of the disease. Dr. H. S. BANKS, of the Leicester Isolation Hospital, says that in the past two years diphtheria has taken on a more malignant form than he has ever previously encountered, and this has led him to explore the possibilities of more intensive treatment. As he and Dr. GEORGE MCCRACKEN record, in a paper published elsewhere in this issue, their cases were divided into groups according to severity, and the 27 regarded as "malignant," having severe adenitis, were treated with very

large amounts of antitoxin. One had as much as 140,000 units in one dose, and the average quantity given was 71,000 units of antitoxin intravenously, with 31,000 units by intramuscular injection. Fifty-two cases whose infection was not quite so severe were given, on the average, 19,000 units by each route, whilst the remaining 214, of only moderate severity, had an ordinary intramuscular dose of 8000 to 16,000 units. The details of technique are set out in their communication and need not be considered further here; it is enough to say that the advantage claimed for the intravenous route is the rapidity with which maximal concentration of serum in the circulation is obtained, contrasting with a delay of 24 hours with intramuscular and three days with subcutaneous injection. BANKS and MCCRACKEN rightly describe toxic diphtheria as an acute emergency, and consider that to give a "haphazard subcutaneous injection of serum" is equivalent to postponing operation on a gangrenous appendix for three days. The total doses, which rose to 200,000 units in some cases, are not, of course, unprecedented. V. BIE, of Copenhagen, is quoted as having used as much as 300,000 units in very grave cases. They are, however, far greater than those in general use by the profession, or previously employed at the hospital, where it is noteworthy that the case-mortality has been reduced from 9·3 per cent. in the preceding decennium to 2·6 per cent. in the year ending last March. Excluding patients who died within 24 hours of admission, and those with laryngeal diphtheria, it was only 1·7 per cent., which is much the same as the death-rate of 1·3 per cent. in a series of 1456 cases treated last year by BIE. It is further stated that the incidence of complications, notably paralysis, has also diminished, and these results are so remarkable that they must lead to reconsideration of the current view that it is useless to give antidiphtheritic serum in doses of more than 30,000 to 50,000 units.

More successful use of antitoxin would not be likely, however, to make much difference to the incidence of the disease, and the question arises whether the best use is being made of the prophylactic methods at our disposal. The answer is in the negative. In this country the progress of toxoid-antitoxin immunisation, though steady, is slow, first because the profession has apparently not been convinced that the method is effective and, secondly, because the public is suspicious of inoculations and disturbed by the disasters of Vienna and Bundaberg. Last year's increase of diphtheria in New York, where immunisation has been tried on a large scale, may lead to disparagement of the method, and it is certainly disappointing. But it must be remembered that the city has a population of 1½ million children under the age of 15, only about a third of whom have been immunised; the remaining unprotected million, —mainly children of pre-school age—offer an abundance of material susceptible to attack during a period of increased prevalence. In Germany the Prussian Health Council has recommended widespread prophylactic inoculation among children in districts with a high incidence of diphtheria, and in Berlin immunisation is being provided free for all children between the ages of one and six years. We are glad to learn that more and more local authorities in this country are offering similar facilities. Thus, at Manchester, the City Council has just approved a scheme by which for six months toxoid-antitoxin will be issued gratis to practitioners and health officers, and immunisation will be recommended to the public through every possible avenue. Information is to be offered at maternity and child welfare centres, at the various children's hospitals, and by way of the school medical service, as is being done in some of the London boroughs, 12 of which now provide means of protection by toxoid-antitoxin inoculation. It is regrettable that schemes of this kind are not being tried more widely, if only on economic grounds; for the sum of £30, which is what a diphtheritic child costs London, would protect 200 children against the disease. The safety of the procedure is actually thrown into relief by the two or three disasters that have occurred abroad, for they would not have been possible with the immunising preparations obtainable from reputable sources in this country. As Dr. VEITCH CLARK told the Manchester City Council, we have the evidence of many large fever hospitals that diphtheria among the nursing staff has been stamped out by the immunisation of nurses before their exposure to diphtheria in the wards, and no accidents following immunisation have been reported in Great Britain. The method may not be infallible but it is certainly safe, and, to quote the London County Council's health committee, "According to authoritative American observers, as a result of observation over periods ranging from three to six years, no child who received the full immunising course, and had given a Schick-negative reaction, subsequently contracted diphtheria." The profession in this country may wish for evidence from sources nearer home, but such evidence on a large scale can scarcely be available until the method is given wider use. The case in its favour is already so good that parents ought to be given a chance of protecting their children if they are willing to do so. Not least ought this opportunity to be given in London and other large cities, where the incidence and mortality of diphtheria are high.

CONCURRENT EVOLUTION.

THERE has been a revival of the public interest in the problems of evolution, particularly in so far as they affect our conception of man's origin. Evidence of this interest is to be found in a recent number of the *Outlook* (June 23rd), where Mr. JAMES STANLEY LITTLE discusses the problem of human origin under the title of "concurrent evolution." Mr. STANLEY LITTLE is an evolutionist, but is of opinion that the theory now accepted by the majority of anthropologists —namely, that all existing races of mankind, white, yellow, and black, are the descendants of a common "Adam," or ancestor, is "false and unscientific." He believes that just as two men may discover the same idea or make the same invention independently, so two new and very similar species or breeds of animals may come into existence separately in the wide womb of nature. The underlying idea, that of parallel evolution or orthogenesis, is one which has been, and is being, much debated by professional students. The late Prof. KLAATSCH put forward the idea, which had been tentatively held by some of the older anthropologists, that peoples of the Mongolian type came of an orang ancestry, while the peoples of Africa came of another anthropoid lineage. Some 16 years ago Prof. WOOD JONES startled his fellow anatomists by putting forward the theory that man and the anthropoid apes had arisen and evolved independently from a basal primate stock, acquiring their many points of structural resemblances in the course of their separate evolution. Quite recently Dr. H. FAIRFIELD OSBORN, who has made a special study of the evolution of horses and elephants, and proved amongst them instances of parallel or "convergent" evolution, has separated man's lineage from that of anthropoid apes and carried both as independent lines into a distant geological past, thereby exciting much current comment

throughout the American continent. Even HUXLEY wrote in a letter to ROMANES (1888) that "it is quite conceivable that every species tends to produce varieties of a limited number and kind, and that the effect of Natural Selection is to favour the development of some of these while it opposes the development of others along their *predetermined* line of modification." Thus in postulating an independent origin and an almost predestined evolution for the diverse races of modern humanity Mr. STANLEY LITTLE can claim a considerable amount of professional justification. The point at issue is not the truth of evolution; that theory is accepted by all intelligent critics; what has yet to be finally determined is the mode by which new breeds or species are produced in a state of nature. The laws of heredity are not in doubt, but their degrees of plasticity have still to be probed.

Mr. STANLEY LITTLE carries his inquiries into the realm of culture and is a candid critic of those who hold that high civilisations of a similar kind must stand to each other as daughter to mother. For example, he is severe on those who seek to trace the old civilisations of Central America to an Asiatic of Egyptian original. Here again Mr. STANLEY LITTLE has stepped unwittingly into another arena of hot professional debate. It was a youthful visit to Mexico that convinced the late Sir EDWARD B. TYLOR that the ancient civilisation of that land must be sought for in the Old World, but as he went on he found so many points which were difficult of reconciliation that he relapsed to the older explanation which postulated that human mentality was the same all the world over and therefore solved the problems of a budding civilisation by adopting corresponding measures. In recent years Prof. ELLIOT SMITH has brought forward much cogent evidence to demonstrate that TYLOR'S original idea was right—that there had been a cultural drift across the Pacific from Asia to America many centuries before the time of Columbus. At the present time the "diffusionist" theory—that a forward swing of the pendulum of evolution, whether in ideas, arts, or in biology, is single-centred—is in the ascendant; from a cradle of inception ideas and invention spread from land to land. A concrete instance may serve to illustrate the nature of this problem. So many are the points of difference—as well as of resemblance—between the railroad services of America and of England that did we not know as a historical fact that one was derived from the other we might be inclined to cite them as cases of independent or parallel evolution.

Mr. STANLEY LITTLE cites the development of languages in support of his contention that evolution works in a "concurrent" way. "All languages were," he asserts, "evolved innocent of literary form, yet they all, or nearly all, generated, so to speak, grammars of sorts, roughly considered, having affinities in their major aspects, however different in their minor details." Certainly it is true that no living thing—and language and art are just as alive as any form of protoplasm—can continue without change, slow as that change may be. Already we see that the English tongue of Britain and that of the United States do tend to move apart, whatever may be the nature of the driving force involved. But when we find languages such as Italian, Spanish, and French, with so many close resemblances, we should explain those resemblances by postulating a common ancestry—even if we knew nothing of Latin. We should never dream of ascribing them to independent or parallel origins. In like manner we are justified in ascribing all Aryan forms of speech to a mother tongue. The biologist in explaining the close resemblances between all living races of mankind proceeds in exactly the same manner. Why should he postulate several sources when one is sufficient? The student of human evolution brigades man and anthropoid apes together because they are so alike in the fundamentals of their structure. He does not postulate separate origins for them, because if evolution is true it is much easier to derive man's structure from that of a primitive anthropoid than from a very lowly ape-like tarsioid.

Annotations.

"Ne quid nimis."

TESTAMENTARY CAPACITY.

THE plain man might think that, if a person be certified as insane, he is ipso facto incapable of formulating a sane will. This was the opinion of Lord Brougham, who held that the mind acts as a whole, and if there be insanity in any one part, then the whole is invalid. With the advance of psychiatry, the issue has been narrowed down to the question—"Was this man capable of making this particular will at the time of its execution?" In Banks *v.* Goodfellow, Lord Chief Justice Cockburn put the pertinent question, "But what if the mind, though possessing sufficient power, undisturbed by frenzy or delusion, to take into account all the considerations necessary to the proper making of a will, should be subject to some delusion, but such delusion neither exercise, nor be calculated to exercise, any influence on this particular disposition, and a rational and proper will is the result; ought we, in such a case, to deny to the testator the capacity of disposing of his property by will?" Thus the whole problem was once more thrown open, and solicitor and medical man must combine to determine whether the testator's mental condition is or is not such as should invalidate his will.

Mr. Noel Middleton has reviewed this position in a paper read before the Medico-Legal Society on June 28th. He reminded his audience that, to have testamentary capacity, a man must possess an understanding of the nature of the business on which he is engaged, a memory of the property of which he has to dispose, and of the persons who have a claim upon him, and must appreciate the manner in which he desires his property to devolve. Soundness of mind is not definable, and the law—fortunately for all of us—does not require a perfectly balanced mind, but lays stress upon the functions of memory and understanding. The disposing mind must have natural capacity not unduly impaired by age, enfeebled by illness, or tainted by any morbid influence. It is essential that no disorder of the mind shall poison the testator's natural affections, but it is immaterial if his judgment be perverted by spite, caprice, or frivolity. Where these affections pass into insanity is as difficult to determine, said Mr. Middleton, as the point at which twilight becomes darkness. The extremes, however, are easily recognisable. From the medical man the court wants to know if he has observed in the patient signs of disease of the brain from any cause, and, if so, whether that disease had any direct bearing on the terms of the contested will. Mr. Middleton classified insanity under four heads, which served his purpose, though they would not appeal to the modern psychiatrist: mania, melancholia, monomania, and dementia. Wills made in the "lucid interval" of mania have often been upheld, but no solicitor should draw up a will under such circumstances without medical advice, and proof would be required that power of rational thought had been restored. A diseased state of mind once having been established is presumed to continue. In Cartwright *v.* Cartwright it appeared that the strongest proof of the existence of a lucid interval arises from the act performed during the alleged interval. If that act were a rational act rationally performed without assistance, a lucid interval might be presumed. The principal danger with the melancholic patient is that, through sheer lack of interest in the world about him, he may consent to sign any document placed before him. Under the head "monomania" Mr. Middleton discussed the vexed question of eccentricity and delusions. Psychiatrists know well the amazing power some paranoid patients have of concealing their delusion when it is to their advantage to do so, and they have more than once defeated

skilled cross-examination. Among the "dementias" come the very large and important senile group, and that most difficult of all patients from the testamentary point of view, the general paralytic. Again, as Sir Robert Armstrong-Jones pointed out in the discussion, there is epilepsy, "one of those dominating tyrannical conditions that affects the emotions perhaps more than any other disease."

The jury is faced with the problem of deciding whether or not the deceased was possessed of testamentary capacity. They look to the medical man for a clear and simple account of what he saw and heard when he interviewed the testator. They are happy if their medical witness can describe from notes made at the time his patient's bearing towards the relatives, his memory for recent and remote events, the nature of his delusions, his attitude towards previous wills and any changes made in the most recent of them, and his ability to enumerate, within reasonable limits, his possessions and his dependants. The medical man should always interview the patient alone, save for a nurse or colleague, and ought if possible to see the patient more than once, taking full notes of each interview. The more facts he can lay before the jury, the more likely are they to be able to come to a just decision.

BERI-BERI ON DIFFERENT DIETS.

IN the old conceptions of the ætiology of beri-beri, rice—and often spoiled rice—played the chief part. We know now that rice is not an indispensable factor, though it is a very frequent one. In No. 8 of the Indian Medical Research Memoirs, J. Taylor, C. de C. Martin, and U. Thant describe an interesting study of beri-beri among rice-eaters in Burma; while at a meeting of the Royal Society of Tropical Medicine and Hygiene, on May 17th last, Dr. G. W. Bray gave an account of infantile beri-beri on the Pacific island of Nauru, where the native population never touches rice, but subsists largely on coco-nut products.

Taylor and his co-workers examined the dietaries of a number of the different racial constituents of the population, and concluded that beri-beri is not an important disease among the native Burmese, but is almost confined to the large coastal towns, where it affects imported Indian coolies, not Mohammedans nor vegetarian Hindus to any extent, but chiefly the so-called meat-eating Hindus. It also occurs among Burmans in isolated forest camps, where conditions cause the food-supply to be severely restricted. The disease is shown to have a seasonal incidence, being most prevalent from August to February; it thus occurs chiefly in the wet period, setting in a couple of months after the onset of the monsoon. This greater prevalence in the wet season is tentatively correlated with the greater deterioration, at that time, of stored rice from damp and moulds. Where rice was used which was freshly pounded at frequent intervals, beri-beri did not occur, whereas in exactly corresponding communities, where long-stored rice was used, beri-beri broke out. It is not known whether the moulds introduce a toxic factor, or, as seems more likely, simply make such pericarp as remains on the rice more friable, so that it easily crumbles off and is lost, and with it the vitamin which it contains. It is interesting to see the factor of deterioration restored to its old important place in the ætiology.

The conditions in which beri-beri develops on the island of Nauru show contrasts with those prevailing in Burma. The disease occurs among a population which never touches rice; it affects only breast-fed infants, and its incidence is heaviest in the dry season. Its appearance in the island is only recent and is connected in an interesting way with the political history of the place. The island of Nauru is held by Australia, under mandate from the League of Nations. Supply of alcohol to native peoples in mandated territory is not allowed. In Nauru the intoxicating drink which the natives have used is made from the toddy palm, but now they are no longer supposed to make it. The toddy contains much yeast, and concentrated toddy yeast was found to cure the infants suffering from beri-beri. When a dietary is very limited, interference even with the source of alcohol may cause disaster. A similar instance occurred in the war, when a South African native labour battalion was brought to France; an alteration was made in the preparation of their fermented drink, scurvy developed, and one of the recommendations made to combat it was the return to the usual native method of preparation.[1] The more frequent incidence of beri-beri in Nauru in the dry season is found to be correlated with a special factor, just as the correspondence of the disease with the wet season in Burma was found to be. In wet weather in Nauru the toddy palm yields much more of the fermentable sap from its inflorescence than it does in dry, and although the consumption of toddy by the natives has been much reduced under the mandate, it is not to be supposed that it would ever completely stop. Thus any factor tending to lower the production of this anti-beri-beri agent would operate to increase the number of cases. Among the interesting contributions to the discussion that followed Dr. Bray's communication was one by Dr. W. H. Aykroyd, who described beri-beri in Newfoundland, where the dietary consists chiefly of white bread and salt meat. He had noticed there that the majority of the cases, 80 per cent. of the whole, were males, and he believed that some social factor must operate to produce this result, but he did not yet know what it was.

SYPHILIS REFRACTORY TO TREATMENT.

THE term "malignant syphilis" is applied somewhat loosely to two distinct groups of cases—namely, those in which the eruption is severe and profuse, with or without profound constitutional symptoms, and those in which the manifestations are refractory to treatment, or recur during the actual administration of modern remedies. A case from the latter group, examples of which occur from time to time in every venereal clinic, is reported in the *Dermatologische Wochenscrift*, June 2nd, p. 727. A man, aged 42, received the usual arsenical and bismuth course for a profuse secondary eruption. Fourteen days later condylomatous lesions recurred on the tongue and round the anus, although the Wassermann reaction was negative. Renewed antiluetic treatment brought about the disappearance of the lesions and a positive W.R. The first mercurial injection of the third course was followed by an urticarial syphilitic eruption, and the W.R. became negative again. This eruption was uninfluenced by intensive treatment with neosalvarsan, bismuth, and iodides, but the W.R. remained negative. An intracutaneous injection was given of syphilitic vaccine from rabbit chancres ("luotestin," 0·2 c.cm.); pronounced local and focal reaction in the lesions followed the first injection, and after the second the W.R. became positive. The third injection resulted in the involution of the eruption. Four more doses of luotestin were given, and the treatment was then purposely stopped. Ten days later there was a gyrate macular rash on the trunk and syphilitic papules on the right tonsil, and now the W.R. was, as it should be, positive. Another injection of luotestin and a small dose (0·15 g.) of neosalvarsan promptly cleared up both these manifestations, which had not recurred at the time of reporting the case. It will be noted that an abnormally reacting organism, indicated by the urticarial eruption, negative W.R., and refractiveness to salvarsan, was converted into a normally reacting mechanism, as evidenced by the macular eruption, positive W.R., and receptivity to salvarsan. Rosner's view that the negative W.R. during the eruptive stage is a sign of defective natural protection is one which will be shared by most authorities, and it seems probable that the injections of luotestin to some extent stimulated production of antibodies. This would explain the appearance of local and focal reaction in the rash itself, but does not altogether

[1] H. W. Dyke: THE LANCET, 1918, ii., 513.

account for the paradoxical gyrate eruption with tonsillar lesions that followed ten days after the seventh injection of luotestin. Rosner suggests the word "contra-reaction," and raises the question of an altered response of the blood-vessels in the lesions, leading to their paradoxical contraction, with dilatation of vessels in the vicinity. The theory is too conjectural for further consideration at present, but there is no doubt that administration of luotestin and similar protein bodies, which may or may not be specific, have a practical bearing on the treatment of salvarsan-refractory types.

THE CAUSE OF SUDDEN DEATH IN CRIMINAL ABORTION.

AN adequate explanation of sudden death during criminal attempts to procure abortion is still to seek; in medico-legal cases the cause has often been ascribed to shock, but this view has not met with general acceptance. Sudden fatalities are so rare in legitimate operations that they have never become associated in the minds of obstetricians with the therapeutic induction of abortion, the evacuation of an incomplete abortion, or the closely allied procedures of dilatation, exploration, and curetting of the uterus. Few even of those with a long and varied experience of hospital and special practice have met with a single case. To explain this apparent anomaly factors peculiar to the special circumstances in which criminal abortion is attempted have been invoked, such as mental distress, fear, and other emotional states in the patient, or haste, lack of skill, or faulty methods in carrying out the manipulation. The economic stress of the war and post-war years in Central Europe has greatly increased attempts to procure abortion, and the mortality accompanying it has drawn attention to the causes of death or of serious complications. In Germany the method commonly adopted is the injection under pressure of fluids, usually soapy water, into the uterus. According to H. von Hoesslin [1] this manipulation is not infrequently followed by sudden and dangerous symptoms, either cardiovascular or cerebral in origin, and a non-fatal case of the latter type is recorded and discussed in the light of others collected from German literature. As it is almost impossible to avoid the injection of air with the fluid, death is frequently ascribed to air embolism, and von Hoesslin's interpretation of his case in the absence of post-mortem investigation is that the quantity of air in the cerebral arteries was too small to cause serious circulatory disorder but was sufficient to interrupt temporarily the nutrition of the delicate cortex. The case he recorded was that of a woman of 26, who collapsed and later became unconscious after the injection into the uterus, at high pressure, of a soap solution. The patient was soon after admitted to the Hamburg-Eppendorf Hospital where she had several left-sided epileptiform convulsions, and on the day after admission expelled a dead fœtus. The urine was free from albumin and sugar, the Wassermann reaction was negative, and lumbar puncture gave no evidence of raised pressure. There were no further fits and consciousness began to return after the fourth day, though the patient had a right-sided paresis, remained drowsy, and complained of severe headache for some time longer. All symptoms gradually cleared up and she was discharged well in four weeks. The passage of blood containing air-bubbles through the pulmonary capillaries is shown to be possible by experimental work on animals. It has been stated, also, that in 30 per cent. of mankind the closure of the foramen ovale is imperfect to a degree sufficient to permit frothy blood to escape from the right to the left side of the heart. When death results from circulatory disturbance following the introduction of air into the vessels the cause would appear to be frothing of the blood on the right side of the heart; in less acute cases there may have been penetration into the coronary veins of chains of bubbles working against the current and the consequent production of cardiac failure. This sequence of events has been produced experimentally in animals by L. Jung and L. Auger.[2] The great importance of learning the real explanation of sudden death in criminal abortion makes it essential that every case of the kind should be carefully investigated, and the possibility of air-entry into the circulation is one that should be fully explored.

[1] Münch. Med. Wochenschr., 1928, lxxv., 764.

FRACTURES SET BY MACHINERY.

Dr. John J. Moorhead, of New York, describes [3] a method of reducing displacement in fractures of the long bones, which he considers superior to those now in use. Plaster-of-Paris cases are applied above and below the seat of fracture and traction and counter-traction are applied through them. The distal portion of plaster is connected with an electromotor which can be regulated so as to exert any amount of undulating force likely to be desirable. When the surgeon is satisfied that correction has been attained, the motor is stopped in the position of maximum pull and the gap between the plasters is filled in with more plaster-of-Paris. The apparatus is not fully described in the paper, nor are the illustrations of much help in elucidating the details of the mechanism, but we gather that the minimum desired degree of tension is produced by a hand screw, superimposed upon which is the alternating pull of the electromotor. The alternate pull and relaxation is produced by an eccentric. The apparatus is obviously not one for every practitioner to keep in his surgery, and is only likely to be used in casualty departments of hospitals which deal with a large number of fractures. Radiograms are reproduced from a case of compound fracture of both leg bones, treated by this method, but judging, as we must, by this one case, we feel no certainty that its results will be any better than those obtainable by less elaborate methods. It seems probable that traction will have to be maintained at its maximum for a good many hours while the fresh plaster is setting to a sufficient degree to resist compression, and that trouble is likely to arise from this pressure. The final radiogram does not show a perfect anatomical result, although functionally it may be perfect. A costly and elaborate apparatus such as this must justify its introduction by improved results after repeated tests if it is to gain a permanent place in the surgical armamentarium.

PERMANENT ENLARGEMENT OF A CONTRACTED PELVIS.

THE permanent enlargement of a contracted pelvis by means of bone-grafts has been effected in two cases by Dr. F. H. Albee.[4] The technique involves a horizontal incision of the symphysis pubis, section of the pubic ligaments, and separation of the innominate bones at the symphysis. A graft taken from the tibia is then inserted in the hiatus between the innominate bones, and is sutured in place with kangaroo tendons. The author explains that the graft method has the advantage over symphysiotomy and pubiotomy that these may have to be repeated at each pregnancy, while the enlargement of the pelvic ring by bone-graft is permanent. Another reason given by Dr. Albee for his preference is that, in his experience, the force required to separate the bones is very great, and he considers it undesirable that this force should be exerted wholly through the presenting part of the child as it must be after symphysiotomy. Presumably he is here considering the child, for it seems doubtful whether for the mother a sudden severe wrench would be any more desirable. Many surgeons, especially in America, believe that the sacro-iliac joints are liable to give rise to painful symptoms, even when so far as can be ascertained they have not

[2] Compt. rend. de la Soc. de Biol., 1928, xcviii., 702.
[3] Amer. Jour. Surg., May, 1928, p. 525.
[4] Surgery, Gynecology, and Obstetrics, 1928, xlvi., 845.

been subjected to undue strain. A permanent wedge, for the insertion of which the bones have had to be separated 1½ inches, must surely cause tension of ligaments, if not some degree of displacement of these joints. It is recorded that both patients operated on were delivered of normal children after operation; one of them has since had three normal labours. We are not told, however, whether they are free from backache or other symptoms which might be expected to follow such a gross insult to the skeletal frame. Indeed, the case reports which form part of Dr. Albee's article are somewhat meagre, and though there was doubtless justification for drastic action, little evidence is submitted on this point. In one of the patients no trial labour seems to have been allowed, and the report of the obstetric history of the other, who had had a craniotomy, gives no details of the events leading up to a catastrophe which might have been due to causes other than a contracted pelvis. Obstetricians are constantly being asked to perform Cæsarean sections on patients who subsequently deliver themselves without interference, and it must be emphasised once again that convincing proof of the impossibility of normal delivery should be forthcoming before any operative procedures are contemplated.

CARDIAC PAIN IN RHEUMATIC FEVER.

IT may be assumed that in acute rheumatic fever præcordial pain with hyperalgesia generally means involvement of the heart. The subject has now been studied statistically by Dr. H. F. Swift and Dr. C. F. Hitchcock,[1] who have investigated 154 cases of acute rheumatic fever over a period of more than seven years. They show that the frequency with which præcordial pain and hyperalgesia is encountered is roughly proportional to the intensity of the rheumatic infection, and hence to the frequency of cardiac involvement. While the absence of cardiac pain during the acute attack does not necessarily show that the heart has escaped injury, its presence is strong evidence of damage to the valves. Præcordial pain with hyperalgesia is observed more often during recurrent rheumatic fever than during the first attack. In the first attack of fever two-thirds of the patients with præcordial pain showed other evidence of cardiac involvement, and almost all the remainder developed cardiac lesions later, or during subsequent attacks. Incidentally, Swift and Hitchcock confirm the well-known observation that patients with subcutaneous rheumatic nodules almost always have concomitant signs of cardiac involvement. They point out that as our knowledge of the nerve-supply of the heart is still incomplete, any conclusions about the mechanism by which the pain arises must be mainly tentative. It may be noted, however, that the cardiac lesions of rheumatism are in the perivascular and adventitial tissues, and that the evidence goes to show that the cardiac tissues capable of giving rise to painful sensations are mainly situated in the epicardium, pericardium, and the adventitial coats of the aorta and coronary arteries, the endocardium and myocardium being probably insensitive. They think that the pain associated with pericarditis is not due to mechanical irritation by rubbing, but rather to the intensity and nature of the underlying inflammatory process. A pericardial rub may often be heard in patients who have no pain, and an extensive pericarditis may be discovered at the autopsy of a patient who has never had præcordial pain. On the other hand, severe pain may be felt before clinical evidence of pericarditis is manifest. Signs of rheumatic pericarditis are almost always accompanied by evidence of valvular and myocardial involvement, but valvulitis and myocarditis of equal severity may occur without pericarditis, and in these cases similar præcordial pain is often present. "It seems, therefore," they say, "that the præcordial symptoms which have been described and attributed to pericarditis by many observers are merely indicative of the severity of the pancarditis."

[1] Jour. Amer. Med. Assoc., March 3rd, p. 678.

THE PROVISION OF GLASSES FOR VERY FINE WORK.

EYESTRAIN among persons performing very fine work is presumably due partly to excess of accommodation required, partly to excess of convergence. An investigation just carried out by the Industrial Fatigue Research Board[1] concerns two sets of workers, the one engaged in the mounting of lamp filaments, the other in a process of threading for the loom in which a thread has to be drawn through as many as 123 eyes per inch. The mounting of lamp filaments was the finer work and for this purpose glasses were provided which added 4 dioptres of accommodation for each eye and 6 degrees converging prisms for work at about 6 inches. At the same time any error of refraction was corrected. The result was an increase of output, though this was slight among those who were previously the best workers. To loom workers the relief given was 2 dioptres of accommodation and 4 degrees converging prisms in addition to the distance correction. Here also the result was favourable, and Mr. T. G. Clegg, who prescribed the glasses, attributes the improvement chiefly to the relief afforded by the convex prisms. The objection is obvious that this wholesale treatment does not sufficiently take into account individual requirements. The need for relief might well be present at the age of 30 when the average accommodation is about 8 dioptres and absent at the age of 20 when it is about 11 dioptres. The power of convergence again is one that varies greatly in different individuals not only with age but with general health and, of course, with muscle balance. Fatigue is liable to ensue, according to Landolt, if more than one-third of the converging power (reckoned in metre-angles) is continuously called upon. Among those workers whose refraction is not normal the wearing of glasses with distance correction would by itself do much to diminish fatigue. But psychological factors, especially the influence of suggestion, cannot be ignored when the results are being assessed, while the incidence of physical fatigue from causes not primarily connected with the eyes has also to be considered. The outcome of this study is that the provision of glasses relieving both accommodation and convergence for very close work has, on the average, a beneficial effect, but to what extent the efficiency of any particular worker may be enhanced by their use cannot be judged without detailed investigation.

[1] On the Relief of Eyestrain among Persons performing Very Fine Work. By H. C. Weston, M.J.Inst.E., and S. Adams, M.Sc. Industrial Fatigue Research Board Report No. 49. H.M. Stationery Office. 1928. 1s. 3d.

THE SHEFFIELD MEDICAL SCHOOL.

THE celebrations to be held next week at Sheffield in connexion with the centenary of the medical school, now the medical faculty of the University of Sheffield, recall to all who would learn of the development of medicine in this country a very interesting page in history. The story has been well told by the late William Smith Porter, senior physician to the Sheffield Royal Infirmary, whose delightful essay on the subject has just been published, and deserves to be widely read. This story commences in July, 1828, but previous to this date a Sheffield surgeon, Mr. Hall Overend, had begun to make collections for a museum of anatomy, human and comparative, the use of which by his apprentices and those of his neighbours was providing a quite unusually good scientific training to Sheffield students. The museum was the private property of Hall Overend and his son, Wilson Overend, but when, in 1828, a movement was promoted by a Sheffield physician, Sir Arnold Knight, and others for the establishment of a medical school in the city, it was proposed to utilise the Overend Museum. This was sheltered in a wing of the Overends' house, and when this building was contemplated as the

nucleus of the new school the troubles that arose from the proposal to employ private property for public purposes were inevitable. For one group of medical men, out of a recognition, no doubt, of the Overends' pioneer labours, desired to maintain the Overend Museum as a permanent centre of the new school, while another group, foreseeing the complications that might ensue, wished to make a new start, taking the form of a Medical Institution. The term "school" was not employed in connexion with this later movement, which was directed rather to the formation of what would now be considered a learned society, and this perhaps accounts for the fact that in the first instance the Overends, father and son, appear to have been quite friendly to the scheme. But the new Medical Institution soon became the centre of medical education in Sheffield, in accordance with the prevailing views for the training of students, and thus for a short time Sheffield possessed two rival schools, with the disagreeable division of opinion thus implied. But the dissension came to an end dramatically by the disappearance of the Overend Museum. The Museum itself had been removed from the back of the Overends' house, owing to the feeling that pathological specimens were inconvenient property to have on domestic premises at a time when the public feeling against body-snatching was so high. And the action was certainly prudent, for in 1835 the Museum was sacked and destroyed by a mob, inflamed by the accounts of the Burke and Hare atrocities. But although the Sheffield School of Medicine did not have its material start in the Overends' Museum, Dr. Porter says, and all will agree with him, that Hall Overend was the true founder of the Sheffield medical school. The rise of an entirely independent institution was the only sound method to ensure permanency for the ideals of the Sheffield citizen, but the ideals themselves were implanted by Hall Overend.

While the beginnings of the Sheffield School of Medicine are quite clearly chronicled, the next stage appears to have escaped public notice generally, for even the Sheffield Local Registers are silent as regards the school between the years 1835 and 1850. Evidently the school showed no promise of great developments before the year 1883. But in that year the association with the Firth College wrought a magical difference in outlook and performance, and four years later the foundation-stone of the new school in Leopold-street was laid, after which the record of success becomes progressive. Of the growth from a university college to a faculty of medicine in a university nothing need be said, as such recent medical history must be familiar to all our readers. We follow Dr. Porter in quoting the concluding words of the inaugural address at the foundation of the Sheffield School of Medicine in 1828. "If it be competent," said Sir Arnold Knight, "to supply that knowledge which the increasing wants of an improving profession so urgently require—if it be calculated to advance the interests of the general practitioner—if by increasing the intelligence it add to the dignity of the profession and render its honours still more an object of ambition among the truly great—if by promoting professional skill it tend to alleviate the sufferings of mankind . . . then will the Sheffield Medical Institution succeed: and it will succeed—because it will deserve success." No doubt these words were greeted one hundred years ago with an approval that their powers of prophecy deserved.

A DINNER TO SIR ROBERT JONES.

ON Thursday, June 28th, a group of surgeons—friends, colleagues, and pupils—entertained Sir Robert Jones to dinner at the Café Royal, London. A book, specially written for the occasion and entitled The Robert Jones Birthday Volume, was presented to him, comprising a collection of surgical essays written by experts in his own subject with full knowledge of the position occupied by Robert Jones. This feeling was admirably set out by Sir Berkeley Moynihan, who was in the chair, in a speech distinguished alike by its brilliance and its affectionate intimacy. As an indication of the feelings which prompted the tribute, a few of Sir Berkeley's actual words may be quoted:—

"This volume, written by a band of brothers, is dedicated with greatest respect and with warmest affection to Sir Robert Jones on the occasion of the seventieth anniversary of his birth. The opportunity to pay tribute to our friend, in whom we recognise one of the masters of surgery, was most eagerly welcomed. We felt that it gave us the chance to say openly what has long been in our hearts, in regard to his work for our profession, and in acknowledgment of the inspiration, encouragement, and example he has given to all who have had the high privilege of association with him. All those who contribute to this volume are proud to think that the influence of Robert Jones, of his methods, and of his teaching has inspired them, has found a place in their work to be transmitted by them in due time to their successors. Spirit alone is immortal. In the practice of orthopædic surgery the spirit of Robert Jones will live for ever. To Robert Jones, great surgeon, inspiring teacher, loyal colleague, and good friend, we affectionately inscribe this volume."

In addition to Sir Robert's daughter and son-in-law, Mr. and Mrs. Frederick Watson, and his son and daughter-in-law, Mr. and Mrs. Arthur Probyn Jones, the following were present: Sir Berkeley Moynihan, Sir Harold Stiles, Sir John Lynn-Thomas, Mr. E. Muirhead Little, Prof. Murk Jansen, Mr. A. B. Mitchell, Dr. Thurstan Holland, Sir William de Courcy Wheeler, Mr. E. Laming Evans, Mr. H. A. T. Fairbank, Prof. E. W. Hey Groves, Mr. R. C. Elmslie, Mr. A. S. Blundell Bankart, Mr. W. Rowley Bristow, Mr. Naughton Dunn, Mr. G. R. Girdlestone, Mr. Harry Platt, Mr. D. McCrae Aitken, Mr. W. H. Trethowan, and Mr. T. P. McMurray.

INTERNATIONAL STANDARDISATION OF DIGITALIS AND ERGOT.

THE first insight obtained by any student into the principle of international units of measurement dates from his school days. When he opened his first textbook on physics he learned with surprise that the metre, which was the familiar basis of many of his sums, could be defined with accuracy only as the distance, at the temperature of melting ice, between two marks cut in a bar of durable metal preserved in Paris. It would be absurd to pretend that such precise standards will ever be available in the sphere of pharmacology or therapeutics, but their development on scientific lines must depend largely on the extent to which it is possible to set up units of measurement common to all countries. The practitioner has hitherto not been very exacting in his demands for standardised drugs, or, indeed, very receptive to suggestions from pharmacologists that a popular mixture is not necessarily a potent one. He has been content to assume that the preparations of such drugs as digitalis, squill, and ergot in common use are of uniform strength without inquiring closely into the grounds for this assumption. Recent research has shown that his confidence is misplaced, and that the great variations in clinical response which he has doubtless attributed to the idiosyncrasies of the patients are at least as likely to be due to the differences in the activity of the drug exhibited. The Health Organisation of the League of Nations is thus doing most valuable work by collecting together experts from all countries with the idea of devising tests for the potency of those therapeutic substances which cannot be standardised by purely chemical means. The permanent Commission appointed by the League to consider the standardisation of sera, serological reactions, and biological products have already dealt with salvarsan, insulin, and pituitary extract on these lines, and the report [1] of their last session, held at Frankfort in April last, shows that they have made considerable progress towards the establishment of a uniform international unit for preparations of digitalis

[1] Publications of the League of Nations: Health, 1928, iii., 6.

The late Prof. Rudolf Magnus of Utrecht was asked in 1925 to make a dried powdered preparation of the leaves of *digitalis purpurea* of a certain strength. He was instructed to use for this purpose a mixture of 10 different powders, made from leaves properly dried at 55–60° C., to adjust its activity by biological assay on cats, and to distribute the preparation for international use. The activity of the standard product was to be controlled by annual tests, and if it should deteriorate, or the supply become exhausted, a new preparation of equal activity was to be made. This work was duly carried out, and favourable reports on the standard product have been received from various countries. The Commission of the League of Nations have therefore decided definitely to adopt the preparation for international use. Arrangements for renewal of the standard have had to be reconsidered owing to the death of Prof. Magnus, and Dr. Bijlsma, of Utrecht, has been entrusted with the task. Only when the new standard has been proved by various biological tests—such as intravenous infusion in mammals or the lethal dose method in frogs—to be identical in activity with the existing one, will it be forwarded to the National Institute for Medical Research for distribution on behalf of the League of Nations. In future, when the dosage of digitalis or its preparations is expressed in units of activity, the unit employed will be the specific activity contained in 0·1 g. of the international standard powder. As to ergot, in view of the results of recent clinical work,[2] showing that the essential factor in the activity of ergot on the uterus is the action of the specific alkaloids, the Commission have decided to proceed with the standardisation of ergot and its preparations by a method measuring its content of the specific alkaloid (ergotoxine or ergotamine). For this purpose the method of Broom and Clark, using the isolated uterus of the rabbit, will be adopted. The possibilities of preparing a stable standard for squill are now being explored. When such popular drugs as digitalis, ergot and squill have been added to the list of standardised substances, some important obstacles to the correlation of clinical impressions with experimental observations will have been removed.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointment has been notified:—Surg. Comdr. G. H. Hayes to *Barham*.

ROYAL ARMY MEDICAL CORPS.

Col. F. J. Brakenridge, late R.A.M.C., retires on retd. pay on reaching the age for retirement.

Lt.-Col. T. E. Fielding, from R.A.M.C., to be Col., vice Col. F. J. Brakenridge.

Maj. J. P. Lynch to be Lt.-Col., vice Lt.-Col. T. E. Fielding.

Capt. T. S. Law to be Maj.

ARMY DENTAL CORPS.

The undermentioned Lts. (on prob.) to be confirmed in their rank: R. G. J. Tovey, A. K. Inglis, W. McD. Birse, W. P. Baxendine, and N. I. Macmillan.

TERRITORIAL ARMY.

Capts. R. B. Lilly and I. J. Williams to be Majs.

2nd Lt. H. R. Vernon (late R.F.A.) to be Lt.

H. A. Eccles, L. D. Williams, and J. Wright to be Lts.

General Hospitals: Maj. J. Wallace, from Gen. List, to be Lt.-Col. and to comd. the 13th (4th Lond.) Gen. Hosp., vice Lt.-Col. (Bt. Col.) A. H. Gosse, vacated.

ROYAL AIR FORCE.

Flying Officer J. Hill is promoted to the rank of Flight Lieutenant.

INDIAN MEDICAL SERVICE.

The undermentioned officers retire: Lt.-Col. A. Murphy and Maj. A. Seddon (on account of ill-health).

[2] See THE LANCET, 1927, ii., 560.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCLXXXIII.

THE SURGICAL TREATMENT OF CHRONIC INFECTIONS OF THE SEMINAL VESICLES.

CHRONIC infections of the seminal vesicles are responsible for a considerable amount of ill-health, causing as they do persistent urethritis with unfitness for marriage, sterility, crippling arthritis, myositis, relapsing cystitis with rigors, epididymitis, and many other complications of "subinfection" or "intermittent bacteriæmia." Local urethral treatment, diathermy, vesicular massage, intravenous injections of neosalvarsan, or protein shock therapy will often bring about a cure. But many cases remain where cure can be hastened or can only be attained by lavage of one or both seminal vesicles by way of the vas. The operation of vasostomy or vasotomy, devised by Belfield,[1] of Chicago, in 1905, since modified by him and others in many important particulars, and performed by him on more than 1100 patients, should be more widely known and practised in this country, since recent improvements in technique have done away with complications which at first proved troublesome and caused the operation to be viewed with disfavour.

The operation has been criticised chiefly on the ground that if it is not properly carried out it may lead to a stricture of the vas with consequent sterility. Quite apart from the fact that most of the patients who need the operation are already sterile as the result of the disease of the vesicle, it is now known that stricture of the vas should not follow the operation when performed according to the latest technique; and, indeed, it is likely to render fertile many perons who without it would be condemned to permanent sterility. It appears, from numerous observations and experiments, that colloid silver, or other chemical, when injected into the lumen of the seminal tract does not injure in any way the epithelial lining of that tract. On the other hand, if colloid silver or other chemical be permitted to leak into the interstitial tissues around the vas, funiculitis may be produced, and in some cases lead to a stricture of the vas at the site of the incision. Such a condition can be remedied by the perfected operation of vasectomy with end-to-end suture. But with the new technique of vasotomy this necessity is not likely to arise. For instance, Dr. Clinton Smith, of Kansas City, reported 100 consecutive cases in which he was able to test the sperm at long intervals after the operation. In 98 of the cases living sperm was found. The chances, then, of sterility seem remote.

All who have had extensive experience of this operation are now pretty well agreed that attempts to leave a cannula in the vas for repeated washings should be given up. It was these attempts that led to reflux of the chemical injected and to subsequent stricture formation. It was found that stricture might result whatever chemical antiseptic was used for the injection. It was not the nature of the antiseptic, but it was the reflux of the antiseptic into the interstitial tissues that caused the stricture. Since colloid silver is found in practice to be the most efficient antiseptic, it should be used in preference to any other so far suggested, such as acriflavine.

The operation should not be carried out in the out-patient department. Patients should be confined to bed for two or three days at least, preferably four to five days.

Technique of Vasotomy.

The operation can be carried out under local or general anæsthesia. If a local anæsthetic is preferred, it is administered as follows. Pick up

[1] Jour. Amer. Med. Assoc., 1905, xliv., 1277.

the cord at the top of the scrotum and inject into its substance 5 c.cm. of 1 per cent. novocaine adrenalin solution. Choose the site of the skin incision near the top of the scrotum and inject along this with a fine needle some 10 c.cm. of ½ per cent. novocaine adrenalin solution.

The vas should be isolated beneath the scrotal skin with the gloved fingers or a special clamp and a small incision be made directly down until the coverings of the vas are exposed. The vas is caught by a pair of sharp-toothed Volkman's forceps and held up in the left hand. With a few touches with a sharp knife the outer coatings of the vas are cleared until the flat handle of a scapel can be gently insinuated between the vas and the other structures of the cord. This is thrust through so as to keep the vas well out of the wound, after which any bleeding points that need attention should be securely ligatured. The vas must be well cleared of the surrounding tissue sheaths, an important point. With a fine-pointed tenotone a tiny opening is now made in a longitudinal direction through the wall of the vas so as to expose the lumen. This can soon be learnt by practice and is the most delicate part of the operation. A fine stiff length of silkworm-gut is now threaded into the vas and will usually pass easily for some 10 in. towards the vesicle. In some cases inflammatory strictures of the vas or inspissated pus will prevent the passage of this gut, in which case it may be thought advisable to desist from injecting the vas. If the lumen is patent a thin sling of gauze is inserted under the handle of the scapel to steady it and catch any drops of escaping fluid. A blunted needle (gauge 20) attached to a well-fitting syringe filled with 10 c.cm. of 5 per cent. colloid silver is insinuated into the lumen of the vas, great care being taken not to rub up the mucous membrane with the point of the syringe. Those who have had little practice are advised to inject sterile water to see if the passage is clear before resorting to the main injection. Five c.cm. of 5 per cent. colloid silver are then slowly injected and should flow easily away to fill the vesicle and ampulla. If 5 c.cm. flow in quite easily, a further 5 c.cm. may be injected. After a pause the syringe is removed and the opening in the vas most carefully closed with one or two 00 catgut sutures. These sutures should only take up the outer coat of the vas and should effectually prevent all reflux of the chemical injected. The vas is then dropped back into place and the skin united with a catgut stitch.

The patient should be confined to bed for at least three or four days to prevent complications, as a little fever is not unusual. The colloid silver may not appear in the urine for many days after the injection. In such cases the effect is always curative. Cures of the infected vesicle will be obtained in the majority of the cases by one injection. If a cure is not attained, then the vas can be exposed a second time a week or ten days later, and the injection repeated at a site a little higher up. In this way risk of stricture and sterility is avoided and the desired result is obtained.

Indications for the Operation.

The agreed indications for the operation are as follows: In all cases of non-tuberculous seminal vesiculitis without intense perivesiculitis refractory to non-surgical treatment due to the gonococcus, colon bacillus, streptococcus, and other pyogenic bacteria: (*a*) causing a chronic urethral discharge; (*b*) aspermia or necrospermia with sterility; (*c*) bacteruria and rigors; (*d*) arthritis or myositis; (*e*) attacks of recurrent epididymitis; (*f*) chronic cystitis following prostatectomy.

The diagnosis is established especially by careful rectal palpation of the vesicles with the trained and expert finger, the presence of necrospermia and pus in a condom specimen of the sperm, persistent relapsing swellings of the epididymis, and bacteriological investigations of the spermatic fluid. Experience can alone decide as to whether the operation must be carried out on one or both sides in any particular case. It is not always necessary to operate on both sides.

Vasotomy in Gonorrhœa.

Recently vasotomy has been advocated for all cases of acute gonorrhœa. I have been so impressed by the immediate and rapid cure of cases of chronic vesiculitis where no other treatment has been employed, except a single lavage of one or both vesicles, that I am quite prepared to believe that lavage of the vesicles on one or two occasions might rapidly cure recent acute gonorrhœa. Kenneth Walker's experiments on animals and certain clinical features of urethritis are suggestive in this connexion. The results of experience can alone decide such a question. The operation of vasotomy has come to stay. It must remain an operation to be practised only by those who are willing to give up some time to learning accurately the technique, and should not be condemned by those who have had no experience of it or who refuse to follow the minute steps necessary for success. I have had many striking results with it in a series of extremely difficult cases.[2] I cannot too strongly call for its consideration by those who are in charge of venereal disease clinics and military and naval hospitals.

FRANK KIDD, M.Chir. Camb.,
Consulting Surgeon to St. Paul's Hospital.

PRESENTATION TO MR. WHITE WALLIS.

WITH 4700 members and a progressive Council the Royal Sanitary Institute has established itself as an organisation which has an important place in the community. Every year it arranges some 250 meetings and lectures in various parts of the country; it conducts examinations for health visitors, and organises those which qualify sanitary inspectors; it annually distributes 60,000 copies of a journal reaching a high standard of public interest; it keeps up a valuable museum visited by large numbers of people; and it has rendered excellent service in arousing interest in sanitary science throughout the Empire, branches having been established in most of the Overseas Dominions. While this steady development has been the work of many hands, it is largely due to the assiduous and capable service of the permanent staff, of which Mr. E. White Wallis, O.B.E., the secretary and director, has been the principal member for 48 years. Mr. Wallis has shown himself a skilful organiser, equipped with imagination and foresight. His gifts have been applied unceasingly to the work which he undertook in 1880, and his success as a manager must be evident to all who have attended the congresses of the Institute or studied its history. At the dinner at the Café Royal, given in his honour on June 27th, the Duke of Northumberland, President of the Institute, was unfortunately prevented from taking the chair as he intended, but Prof. Bostock Hill, who took his place, clearly expressed the feeling of the company when he said that Mr. Wallis's services, both in quantity and quality, must be almost unrivalled. After a presentation had been made, Mr. Wallis referred to the widespread activities of the Institute, which had now, he said, attained a standing which would form a foundation for future work and development. In this development we hope that he will continue to take an active share.

[2] THE LANCET, 1923, ii., 213.

AMERICAN BEDS AT THE ROYAL FREE HOSPITAL.—Last week Mr. Horace Lea Washington, United States Consul-General, presented the endowment and name-plate of the "Martha Washington" bed for which £1000 has been given by the American Women's Club. At the same time Lady Hewart presented a cheque for £400 for the endowment of a "Louisa Mary Alcott" crib.

Special Articles.

DEATHS AND DEATH-RATES IN THE MERCHANT MARINE, 1926.

BY FLEET-SURGEON W. E. HOME.

A RETURN[1] published by the Board of Trade summarises the deaths that occurred in 1926 in the mercantile marine. No death-rate for seamen is prepared by the Board of Trade, on the ground that no precise knowledge is available of their number, but only of their deaths. The Board does, however, allow that "the numbers of persons forming the first crews of vessels," stated annually in the above-mentioned return, furnishes "an approximate basis for estimating the variations in the extent of the risk from period to period." I have prepared Table I., attempting to use such data as is available from the return and from the Registrar-General's Decennial Supplement on Occupational Mortality (1927, H.M. Stationery Office, 7*s.* 6*d.*), in which (pp. 126–128) is a discussion of the mortality of seamen, 1921–23. This supplement did not appear till 1928.

The total number of deaths of employed or occupied sailors is known, and their causes are nowadays, we are told, being more correctly stated. It is the average daily number of seamen amongst whom these deaths arise of which we are uncertain. Every year the numbers in the "first crews" of ships are published, and every five years a census is taken of all seamen in seagoing vessels, registered in the British Islands, except yachts and fishing boats. This census, taken all over the world on a single day in 1901, 1911, and 1921, showed a number much less than the number given in the return of persons forming "first crews," the proportion being respectively 82 per cent., 81 per cent., and 55 per cent. in the three years. The census in 1921, the latest available, was taken during a coal strike, attended with great unemployment for seamen. What proportion of "first crews"

TABLE I.—*Deaths and Death-rates in the Merchant Marine.*

	1901.		1911–12.		1921.		1926.	
No. of "first crews"	146,860		165,159		173,110		159,950	
Percentage taken	90		90		70		90	
No. of men taken	132,170		148,640		121,177		143,995	
	Deaths—		Deaths—		Deaths—		Deaths—	
	No.	Per 1000.	No.	Per 1000.	No.	Per 1000.	No.	Per 1000
Enteric	35	0·27	58	0·39	27	0·22	28	0·19
Small-pox	17	0·13	8	0·05	4	0·03	7	0·05
Malaria	28	0·22	31	0·21	40	0·33	13	0·09
Tubercle (all)	45	0·34	44	0·29	26	0·21	41	0·28
Pneumonia	50	0·38	52	0·35	56	0·46	63	0·44
Diseases of the circulatory system	126	0·96	88	0·59	55	0·45	56	0·39
Suicide	69	0·52	46	0·30	30	0·25	30	0·21
All diseases	555	4·20	519	3·50	362	2·99	410	2·85
Alcohol	120	0·91	111	0·74	42	0·35	31	0·21
All violence	978	7·40	1503*	10·11	461	3·80	448	3·11
All causes	1653	12·50	2133	14·35	865	7·14	889	6·17

* 604 (4 per cent.) drowned in *Titanic*.

can we then assume to be the number usually employed? I submit that 90 per cent. would in ordinary times be near it, and in 1921 70 per cent., and that these figures may be used, in the words of the Board of Trade, as "an approximate basis for estimating the variations in the extent of the risk." The Board of Trade gives no suggestion of its own idea of these variations, nor until this year has any official figure been put forward; even now no figure is given for occupied seamen, but only for occupied and retired seamen together.

In Table I., then, is a statement of death-rates in the merchant marine in 1901, 1911, 1921, and 1926, with the numbers of "first crews"; the number of men supposed to have been daily on board ships in each year, and the deaths from certain causes are also given. The greatest decrease in death-rates in the quarter of a century is in those from alcohol, from 120 deaths (death-rate 0·9) in 1901 to 31 (0·2) in 1926; but the rates for enteric, small-pox, diseases of the circulatory system, suicide, and "all diseases" have satisfactorily decreased, for tuberculosis (all forms) rather less, while those for pneumonia seem larger. Except as regards alcohol and suicide the decrease is not large enough to dispel anxiety about the health of the merchant marine. Is it improving in health as rapidly as is the population ashore?

Table II. sets out the death-rates of the merchant service in 1926, obtained as has been described, against those of the Navy (1925) and the Army (1926), taken

TABLE II.—*Death-rates in the Services and the Merchant Marine.*

—	Navy. 1925.	Army. 1926.	R.A.F. 1926.	Merchant marine. "Occupied," 1926. Board of Trade.	Merchant marine. "Occupied and retired," 1921–23. Registrar-General. Ages 20–45.	Merchant marine. "Occupied and retired," 1921–23. Registrar-General. Ages 20–65.
No. of men	90*	190*	33*	144*	155*	200*
Enteric	0·03	0·06	0·1	0·19	—	—
Tubercle (all)	0·40	0·17	0·2	0·28	2·2	2·1
Pneumonia	0·15	0·31	0·2	0·44	—	—
Dis. of circulatory system	0·15	0·11	0·15	0·39	—	—
Suicide	0·11	0·14	0·2	0·21	—	—
Accidents	1·32	0·74	3·39	3·11	3·10	3·4
All causes	2·82	2·35	4·6	6·17	10·4	13·5

* Thousands.

direct from their reports published this year. The death-rate of the Air Force (1926) is calculated from the figures of deaths given in that report, which is concerned with a much smaller total of men than are those of the other services. Next come the merchant service figures of 1926, followed by two columns, calculated from figures on p. 128 of the Decennial Supplement about which some remarks must be made.

When that Decennial Supplement was being prepared some doubts were thrown on the statistics of the occupational mortality of seamen presented in the corresponding report for 1901. These doubts were considered by a departmental committee and (p. 126) it was decided that some better system of measuring the occupational mortality of seamen should be devised; the figures in the last Decennial Supplement are the result.

The uncertainty about the numbers of seamen employed from day to day, the many countries in which their deaths are registered, the loose connexion of seamen with their trade, the readiness with which they drop it when tempted by good conditions ashore or are forced out by disabling illness—these and other difficulties are carefully discussed in Appendix B, On the Mortality of Seamen, in the Supplement. (The corresponding section in the 1901 report was signed by Dr. John Tatham; this comment is not signed.) When the numbers employed had been assembled from the returns of the censuses taken in England and Wales, Scotland, Isle of Man, &c., and at sea, the deaths of seamen had to be ferreted out, those of lascars excluded, and finally deaths and populations were arranged by ages, 20–24, 25–34, and up to 65 years, as is done for all occupations. From these figures comparative mortality figures (C.M.F.) are calculated, showing the deaths that would arise among 109,296 persons in the industry, if their ages

[1] Return of Shipping Casualties to and Deaths on Vessels, 1926. H.M. Stationery Office. 1928. 2*s.*

were distributed as they are in the standard population (occupied and retired civilian males), and if the death-rate of each age-group had been as in the industry in question. In the standard population, 109,296 occupied and retired civilians, 1000 deaths happened in the year, and when the C.M.F. for seamen has been calculated we find the following figures (p. 218):—

	Respiratory tuberculosis.	Violence.	All causes.
Occupied and retired civilian males	163·5	73·6	1000
Occupied and retired seamen	221·5	389·7	1768

In the report 178 groups of occupations are discussed, and it is remarked upon that the seamen's C.M.F. from all causes is higher than that of 171 occupations; to which might have been added the fact that the seven higher all have far fewer members. The report proceeds to note that the rate from phthisis is higher than in 131 occupations, "but that for violence is quite beyond the range of land experience. The highest combined suicide and accident C.M.F. in Table C is 236·3, that for conveyors of material to the coal shaft [72,026 persons], which is about 39 per cent. less than that for seamen."

No death-rates for all seamen are given, but they can be calculated from the figures presented, and thus I have obtained the rates in the two last columns of Table II. In one of these columns are given the death-rates of occupied and retired seamen, ages 20–45 for comparison (crude only, the age-distribution being so different) with the service figures, whereas the other gives the death-rates, ages 20–65, for comparison with the death-rates amongst the merchant marine on active service, the seamen occupied from day to day.

We have not yet discovered the true death-rates of seamen in the merchant service; but everyone who reads Appendix B in the Decennial Supplement will realise that seamen, occupied and retired, have an enormous death-rate from violence, and that their death-rate from disease is also extravagantly high. This may be because they are the only large body of British workers whose health is not under medical supervision. The Board of Trade have made no statement indicating realisation of the situation shown by the Registrar-General. The Board may not realise that under their administration seamen have had much higher death-rates than have most other workers who are under the care and supervision of the Ministry of Health. If one thinks of the care the Board of Trade takes of the health of seamen one cannot but recall the bitter words of Alcestis as she thought of the stepmother with whom she saw her children threatened—*ἐχίδνης οὐδὲν ἠπιωτέρα*, which may be reasonably translated "no kinder than a cockatrice."

SMOOTH AND ROUGH STRAINS OF BACTERIA.

IN the days of Koch it was accepted by most bacteriologists that a given species of bacteria was extraordinarily constant in all its characters. When variations were suspected it was found expedient to ignore them in order that a body of knowledge might be built up as to the behaviour of the less variable cultures, whose features were uniform, and whose morphology and physiology was constant. The occurrence of transmutation from one species to another has not been proved, but during the last 20 years variability in certain directions has been gradually accepted and the correlated changes noted and collected.

E. Weil and A. Felix, H. Braun, P. Bruce White, M. Robertson, and others, working with *B. proteus*, *B. paratyphosus*, *B. tetani*, &c., have shown that motile species of bacteria usually contain two distinct kinds of antigenic and agglutinable substances, associated—the one with the flagella, called the H, the other with the body of the bacterium, called the O antigen. Non-motile cultures were also obtained as variants which contained only the O and no H antigen. By these observations they confirmed the earlier work of Smith and Reagh.[1] The H antigen is responsible for agglutination of emulsions by serum in large, loose, flocculent clumps, formed by the entanglement of the flagella; the O antigen especially when present alone, as in the non-motile forms, is revealed by the agglutination of the bodies in small, dense, coherent grains. In normal cultures, of *B. typhosus* for instance, the two substances are present and by varying independently may affect the results of agglutination and other serological tests, since each has its appropriate and independent antibodies. Differences in one or other of these two antigens are responsible for the distinctions between types in the Salmonella group. The H antigen is not demonstrable in emulsions of bacteria which have been heated at 100° C. for one-half to two hours, but the O is thereby unaffected. On the other hand, changes in the O antigen alone are associated with the peculiar serological behaviour of the so-called "rough" variants derived from cultures of certain bacteria; the H antigen remaining unaltered. Indeed this change in the O, sometimes called the somatic antigen, is the main distinction yet recognised between the behaviour of the "rough" and "smooth" strains on which so much work has recently been done. This work dates from 1920, when Arkwright [2] showed that the spontaneously agglutinable variants which could be isolated from old cultures of normal strains of *B. typhosus*, *B. dysenteriæ*, &c., by selecting colonies of peculiar appearance on agar, also had special serological characters indicating considerable deviation from the type in their antigenic content. He called the normal strains, which made turbid growth in broth and from which good permanent emulsions could be made in salt solution, the smooth or S. form, because the round, dome-shaped colonies were shiny on the surface; the colonies of the spontaneously agglutinating (rough) form were irregular in surface and outline. The rough (R.) form could not be made into a permanent emulsion in salt solution, unless the content of salt was reduced to 0·4 per cent. or sometimes even to 0·1 per cent., and broth cultures instead of being turbid became clear with a large, clumped deposit. The R. colonies were not always typically jagged in outline, and shagreened on the surface, but might only appear dull by reflected light, opaque and coarsely granular under the low power. Serum made from the R. form did not agglutinate the S. form, and serum from the S. had only slight action on the R. emulsion. Absorption with R. emulsion removed any R. agglutinins that were present in the S. serum, without affecting the S. agglutinins. A culture might contain pure S. or R. forms only, or a mixture of the two in varied proportions. Very similar observations have since been made on many strains of *B. dysenteriæ*, *B. typhosus*, *B. coli*, Salmonella, and so forth.

The change from the S. to the R. form is usually independent of any alteration in motility. Moreover, as has been noted above, the results of experiments on agglutination and absorption of agglutinins and on the production of agglutinating sera indicate that the change from S. to R. is concerned only with the O or somatic antigen and does not involve any alteration in the H or flagellar antigen.* The smooth somatic appears to be changed into the R. somatic antigen. Schütze [3] and P. B. White [4] also showed that strains which differed widely when smooth often had close affinities in the rough form, since this appeared to have lost the specific S. antigen. The independence of the two changes, from H to O and from S. to R. may be shown by obtaining the following four variants from a single motile strain: (1) normal or smooth

* In the U.S.A. P. Hadley and others have used the terms S. and O. in a rather different sense to that defined above. S. has been taken to mean the complete normal form whether flagellated or not, and the O. form has been represented as intermediate between the S. and the R. In so doing, these writers ignore the existence and importance of the H. or flagellar antigen. Their usage appears to be connected with a scheme of cyclic changes in bacteria along definite lines, which is not at present generally accepted.

motile, containing H and S somatic antigens; (2) rough motile, containing H and R. somatic antigens; (3) smooth, non-motile, with only S. somatic antigen; and (4) rough non-motile, with only R. somatic antigen. The permanence of these variants is still a matter of uncertainty. They may all four remain unchanged through many subcultures, but the tendency to revert or change further varies with the strain. Broth cultures of S. tend to change to R. if not subcultured for many days. R. cultures, if free from S. elements, are said to be incapable of reversion, but this is very doubtful.

Changes in Virulence and Pathogenicity.

The significance of these variations has not yet been established, though various isolated observations have shown that they may be connected with changes in virulence and pathogenicity at least in some organisms. It has been found by Topley,[5] Goyle,[6] P. B. White, and others, that in Salmonella and *B. typhosus* the R. form is much less pathogenic than the S. In the case of *B. dysenteriæ* this has not been shown, since both S. and R. forms make strong toxin. There is also experimental evidence that vaccines made with the R. form of *B. paratyphosus* A and *B. typhosus* are much less protective than those made with the S. form. When variants of other classes of bacteria have been examined, somewhat similar facts have been elicited. F. Griffith[7] found that by selecting colonies of pneumococcus with a dull surface he could obtain a variant which he called rough and found to be of very low virulence for mice. This form was not spontaneously agglutinable in salt solution.

In America O. T. Avery, M. Heidelberger, H. Reimann, and L. A. Julianelle have determined that there is a change or degeneration of the antigen of pneumococcus in certain variants which have lost their capsule. This "degraded" form they consider identical with the R. form of Griffith. It has lost its type specificity and is non-virulent, but has agglutinins in common with the R. form of other pneumococci.

They have traced this change to the loss of a definite carbohydrate substance associated with the capsule. Julianelle also found precisely similar R. forms of the capsulated *B. pneumoniæ*. It seems probable that a somewhat similar loss occurs in the change from the S. to the R. form of *B. dysenteriæ*, *B. typhosus*, &c., but the chemical work on this latter group has hardly reached so complete a stage. In the case of the Gram-negative intestinal group and of the pneumococcus, and pneumobacillus, the R. form can be produced by growing the S. form in immune serum. M. Cowan found that certain variants of *Streptococcus hæmolyticus* derived from colonies with uneven surface and outline were less virulent than those from smooth-domed colonies, and that the uneven colonies led to growth in broth with a large deposit and a clear supernatant. She therefore called these variants rough on the analogy of *B. dysenteriæ*. Later observations have shown that irregular streptococcus colonies forming clear broth cultures with large deposit may be more virulent than the smooth-looking colonies which form turbid broth colonies (Todd,[8] Andrewes,[9] 1927–28), and that virulent and non-virulent variants of the same culture may have almost indistinguishable colonies. In fact, the results of work on so-called S. and R. variants of streptococci are at present inconsistent and require further work for their elucidation.

It is desirable even at this stage to give the term "rough" uniform significance, and as far as possible to restrict its use to variants with one set of characteristics. The change in the somatic antigen should be regarded as the most essential change in passing from S. to R. This is almost always associated in the Gram-negative intestinal group of bacteria with spontaneous agglutinability in salt solution, but not in distilled water. The appearance of the colonies is usually a valuable guide to the detection of R. variants, but this is not always the case and R. colonies of the same strain may differ in appearance. It is not clear yet how far the variants described above are merely shifting states within the normal limits of the species. The wide affinities of the R. form suggest an approximation to a primitive state from which more definite types have developed. The suggestion that loss of virulence may occur in the body of an infected animal in connexion with change from S. to R. has not yet been established, but this and other questions are receiving attention from the large number of workers now investigating the anomalies of rough and smooth variants.

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THE DAIRY CONGRESS.

THE first three sessions of the Eighth World's Dairy Congress were held at the Central Hall, Westminster, from June 27th to 29th. The Congress has attracted some 2000 delegates representing 42 countries, and the interest shown suggests that the civilised nations of the world are realising that, as Sir George Newman put it, the dairying industry is not only a trade but a service for health. Prof. E. V. McCollum pointed out, moreover, that in countries where dairy animals are abundant the physical development of the population reaches a high standard.

The proceedings on the first day were opened by Mr. Walter Guinness, Minister of Agriculture, who referred to the changes which had been brought about in the last hundred years by urbanisation and the growth of the transport problem. It was possible, he said, that we were now reaching the limits of the distribution of raw milk. The dairy industry in England and Wales was the most important branch of agriculture and the value of its products was about £58,000,000 a year. Dairy herds were increasing and had reached the record figure of 2,800,000. The consumption of milk in England was, however, much too small. Even greater developments with an increased demand would result from public confidence in an improved supply. Mr. J. Maenhaut, President of the National Dairy Society of Belgium, brought greetings from his country, and Dr. F. E. Posthuma, formerly Minister of Agriculture in the Netherlands, described how dairying in Holland had changed from a family industry to a factory business. He held that the owner of the farm should also be part owner of the factory. It was probable that there would be many more milk products in the future. It was necessary to organise both farms and factories on an international as well as a national basis.

The business of the Congress was taken in sections. In the following notes are summarised a few of the numerous communications which had a bearing on public health.

Feeding of Milch Cows.

Mr. R. B. Boutflour (Harper-Adams Agricultural College) drew attention to the fact that an average cow can only efficiently digest 30 lb. of dry food. If it is given 40 lb. its digestive organs are likely to suffer and a diminished supply of milk will result. He emphasised the need to control both the total amount of food and the amount of indigestible fibre and the importance of careful preparation of the cow for her lactation. An adequate supply of water and three milkings in the day produced high yields; many herds now giving an average of 700 gallons per annum could have their output raised by 50 per cent. if attention were paid to these matters. Mr. James Mackintosh (Reading) drew attention to the very

varying soils of the districts in which dairying was now carried on, and to the need for adapting the feeds to the crops which could be best grown in the district. Analyses of the district crops was desirable. The use of roots for feeding was chiefly a question of cost. Dr. H. E. Magee (Rowett Institute, Aberdeen) drew attention to the drain on the calcium reserves of the cow caused by heavy milking, and pointed out that if this was not counteracted in the feed and an adequate supply of vitamin D secured at least a reduction of milk, abortion, or tuberculosis might result. An American speaker drew attention to the deficiency of phosphorus in the soil of Minnesota, where adjustments had had to be made for the excess of sulphate of magnesia in the water.

Milk Recording.

Many communications testified to the good work done by milk-recording societies, and it was urged that more could be done through such societies to secure the elimination of dust in the cowsheds and the prevention of tuberculosis. In New Zealand, where the cow and human population are the same—namely, 1,400,000—it was claimed that recording had brought about an increase of 30 to 40 lb. per cow in butter-fat. The milk there is sold according to fat-content. Scotland was mentioned as a pioneer in recording, and there also the creameries pay for milk in proportion to the fat-content. It was pointed out that it is worth while to do the recording twice a day, so that steps can be at once taken to counteract a drop in yield or the beginning of illness. It was also stated that many farmers employed inefficient milkers. One member of the Congress went so far as to suggest the promotion of sweepstakes among the milkers to promote a spirit of competition. Another suggestion put forward was the trial of a longer interval between calvings—e.g., 15 or 18 months. The need for a standardisation of milk records was put forward by Prof. Prawochenski (Poland) and other speakers.

Grading of Butter and Cheese.

From Australia, New Zealand, and Canada came the information that the grading of butter and also of cheese had by instigating competition amongst the manufacturers produced a great improvement in quality. There was some discussion as to the want of agreement in the grading of the same butter before it left Australia and after it reached London, and it was also pointed out that the system of grading might be helped if steps could be taken to enable the consumer to know what grade he was purchasing.

Milk Control and Designated Milk.

Many papers dealt with the question of control of the milk-supply, and there was general agreement that the best control was by the banding together of producers who believed in sound work and realised that success lay in securing the maximum number of satisfied customers. There appeared to be complete unanimity that the cost of control and inspection by the central and local governing bodies was for the good of the whole nation and should be borne by the taxpayer rather than by the ratepayer. Much was said with regard to designated milks in this country. Among the points made were the need for a much greater incentive for the production of Certified Milk and for a change of nomenclature. The titles of the designated milks were admitted to be most misleading, and "Grade A" was frequently thought by the public to be the best class of milk. Mr. Wilfrid Buckley drew attention to the fact that even a recent British Red Cross publication had fallen into this error. Sir George Newman agreed that the present nomenclature was unsatisfactory and asked the Congress to supply a unanimous suggestion for its amendment. He also pointed out, when the usual controversy between advocates of clean milk and pasteurised milk respectively arose, that pasteurisation and the production of clean milk were not really antagonistic aims. Pasteurisation might make dirty milk safe, but it could not make dirty milk clean. Several speakers pointed out that milk in the U.S.A. was graded before it was pasteurised, and others urged that in this country all milk except that from tubercle-free cows should be pasteurised.

Various Milk Products.

As compared with previous national milk conferences, there was evidence of a broader view as to the uses of milk. Captain J. Golding (Reading) said that the Dairy Institute was not sufficiently alert to prevent the waste of milk by-products, such as whey and skimmed milk. The addition of skimmed milk greatly improved bread. Mr. H. E. van Norman (Chicago) said that American bakers were successfully mixing dried skimmed milk with flour for baking in the proportion of 3 per cent. to 8 per cent. Skimmed milk was also being used for the manufacture of biscuits and ice-cream. Mr. F. Rasmussen, Secretary of the International Association of Ice Cream Manufacturers, showed that ice-cream was now an important food in the U.S.A. Nearly as much milk was used to make ice-cream as to make cheese, and the consumption had gone up from one gallon per head per annum in 1905 to about three gallons in 1926. Nearly £100,000,000 was invested in its manufacture. About two-thirds was consumed in the four summer months and absorbed the summer surplus of milk, thus helping to stabilise prices. The ingredients were milk products, plus sugar and flavouring agents, and the average ice-cream contained 22 per cent. of milk solids. The manufacturing associations hoped further to increase the sale by supplying housewives with ice boxes. Prof. A. Mertens (Louvain) said that Belgium was following the lead of America in the matter of ice-cream. Interest in the ice-cream question gave rise to a special session.

The Rôle of the Veterinary Surgeon in the Improvement of the Milk-supply.

Two sessions were devoted to this question. The discussion brought out a strong feeling that biological tests and routine veterinary inspection should be compulsory and universal, and that the veterinary inspection should not be limited in its purpose to the control of tuberculosis, but should be utilised for improving the feeding and hygiene of the cattle. Dr. W. G. Savage estimated that the cost of inspection would be approximately from 1*s.* 6*d.* to 1*s.* 8*d.* per cow per year, which meant from a quarter to one-third of a million per annum for England and Wales and from £10,000 to £14,000 for his own county of Somerset. This cost was a heavy burden on poor agricultural counties, mainly for the benefit of urban areas. Prof. Porcher said that veterinary inspection was not compulsory in France, but had been made optional for the departments. An able paper by a veterinary surgeon, Mr. Trevor F. Spencer (Kettering), expressed the view that the present legislation as administered was doing nothing to reduce the prevalence of bovine tuberculosis and that a much more determined effort was needed. There was very little regular veterinary inspection. His views (as to the futility of the present administration of the law) were largely in accord with those expressed in THE LANCET last year by Dr. Savage. With a proper effort the expense of dealing with tuberculosis should be a decreasing one year by year. Under present conditions the expense would be a continuous one. Mr. Spencer's paper caused considerable discussion as to whether the local knowledge of the part-time veterinary surgeon outweighed the disadvantage caused by the conflicting interests of his private clients, and also brought out the fact that, while veterinary inspection was not appreciably used in England and Wales, it was in full operation in most of the dairying counties of Scotland. Several speakers blamed the Ministry of Health for failure to encourage the application of veterinary inspection in England and Wales. Most of them were inclined to think that the first step with regard to tuberculosis was the general enforcement of present legislation with an encouragement of designated milks and a gradually increasing stringency of the enactments and that the

time was hardly ripe for new legislation or the extended use of the tuberculin test. Mr. Hugh Begg (county veterinary inspector, Lanark) pointed out that 75 per cent. of the tuberculous cows were aged and that more attention might be given to killing off aged cows. Mr. A. Gofton (veterinary inspector, Edinburgh) referred to the insufficient liaison between the departments of agriculture and health, and pointed out that most of the burghs of Scotland had had veterinary inspectors for 25 years. Captain R. Simpson (veterinary inspector, Cumberland) was as optimistic as the Scottish speakers as to the good effects of present legislation in his county. Prof. Ostertag took part in the discussion. A breeder of pedigree stock, timorous as to the use of tuberculin, was promptly answered by another pedigree breeder (Hon. G. Corbett, Ayrshire), who pointed out that it was essential for anyone who produced for export to have tubercle-free herds. He added that they hoped soon to have special accommodation and special prizes at the Highland show for tubercle-free animals. He referred to the danger of infection from manure and mentioned two precautions which he had adopted —namely, double fencing of the fields used by the tubercle-free cattle, and, in the event of reactors being found at the half-yearly testing, the segregation of the two neighbours of the reactor, until it was certain that they were not infected.

Food Value of Milk and Propaganda.

There were many papers on the food value of milk. Prof. McCollum referred to large scale experiments on the gain to American school-children from an extra allowance of milk, and Prof. Pirquet (Vienna), after referring to the similar experience of Dr. Corry Mann and Dr. G. A. Auden in England, mentioned that the use of milk was increasing in Austria. There were many papers on methods of propaganda, and Dr. Ernest Eber (Hungary) moved a resolution for the establishment of a central office in London for the organisation of dairy propaganda throughout the world. This resolution was referred to the Executive Committee. The question of the education of those engaged in the dairying industry produced communications from Dr. Stenhouse Williams, Dr. Otto Gratz, of Hungary, and Dr. F. Zaribnicky, of Vienna.

The Congress also held sessions in Reading and Edinburgh; many tours of professional interest to its members are being made, and the Congress will not conclude until after the meeting of the Royal Agricultural Show at Nottingham, July 10th to 12th.

Conclusion.

The arrangements for the sessions and tours brought credit to the organising ability of the secretary, Mr. Arthur D. Allen, and the tone of the discussions justified the contention of Mr. Walter Guinness at the outset, that although the delegates to the Congress were competitors and in the markets of the world, they were coöperators in education and research.

LEAGUE OF NATIONS.

AN INQUIRY INTO THE RADIOTHERAPY OF CANCER.

THE Subcommission of Experts charged by the Cancer Commission of the League of Nations with the study of Radiotherapy of Cancer held its first preliminary meetings on June 18th and 19th. These were attended by the President of the Cancer Commission, Sir George Buchanan, senior medical officer at the British Ministry of Health.

This subcommission included the following experts in radiology and gynæcology:—

Prof. Cl. Regaud, Director of the Radium Institute of the Curie Foundation, Paris (President).

Dr. C. Comyns Berkeley, Director of the Middlesex Cancer Charity Hospital, Gynæcological Service.

Prof. Döderleim, Director of the Gynæcological Clinic of the University, Munich.

Prof. W. Lahm, Director of the Laboratory Research Work, the State Gynæcological Clinic, Chemnitz.

Prof. van Rooy, Director of the Gynæcological Clinic of the University, Amsterdam.

M. R. Ferroux, Chief of the Therapeutical Works at the Curie Foundation, Paris.

Prof. Voltz, Gynæcological Clinic of the University, Munich.

Investigator: Dr. Janet E. Lane-Claypon, attached to the Departmental Cancer Committee of the Ministry of Health, London.

Prof. G. Forssell and Dr. Heyman, of Radiumhemmet, Stockholm; and Prof. Pestalozza, Director of the Gynæcological Clinic, Rome, were absent.

The subcommission was appointed in consequence of a report by the Cancer Commission to the Health Committee of the League in May last, in which emphasis was laid on the importance of collecting data from different sources regarding the methods of radiological treatment and their modern results. In addition, it was suggested by the President of the Cancer Commission that it might be well for the subcommission to take cognisance of the following points: 1. Available supplies of radium. 2. The centralisation of radium in each country for the supply of the smaller clinics and individual practitioners, in the event of this being considered desirable. 3. The form of record which should be kept with the view of comparing the results obtained in different countries after some five years' observation after cessation of treatment.

The subcommission first considered in detail the nature of the information to be collected and the sources to which application should be made. It was considered necessary to obtain individual details of a, numerically, large series of cases of cancer of the uterus divided according to their treatment (*a*) by radium, (*b*) by X rays, or (*c*) by both—taking account only of those cases in which the treatment was completed more than three years ago, and in which the after-histories were traceable; it will also be necessary to have statistical data of all observed cases in each of the clinics taking part in the inquiry. The details to be given were settled, but the subcommission left the preparation of model forms, cards, &c., to the Health Secretariat, which for this purpose will have the advice of Dr. Lacassagne (Paris), Prof. Voltz (Munich), Dr. Heyman (Stockholm), in addition to that of Dr. J. E. Lane-Claypon, who has been appointed the technical inquiry officer of the Commission for this purpose. The same group of experts will assist in the collection and codification of the replies received.

The clinics and institutions to be applied to are to be limited in the first instance to those which possess a sufficiently large experience, and their assistance may be invited either directly or through national health administrations or other appropriate national organisations. As some cancer or gynæcological clinics have already expressed their willingness to coöperate in an inquiry whose practical value they recognise, it is hoped that those data can be collected without delay. It is intended that the results when analysed should be submitted in the form of a report to the Committee, and published in due course. While the clinics or institutions chosen will be specially requested to follow the system of record proposed to them for purposes of international comparison, they will also be invited to summarise their own observations and views regarding the efficiency of radiological treatment in any manner which they consider may be useful to the Commission. The inquiry as such is to be limited to uterine cancer (cervix and body), but accessory information regarding cancer of other gynæcological sites may be supplied for separate study.

On the broader questions relating to the treatment of uterine cancer by radiology, the President submitted a series of considerations which, after a general discussion, were adopted by the subcommission as representing the most important directions to which its future discussions should be directed, and on which definite recommendations should be

made in due course to the Health Committee with a view to publication. Among these considerations were: 1. Propaganda among doctors and the general public in order to ensure the early discovery and early and correct treatment of cancer of the uterus. 2. Increase in the number of consultation centres. 3. Organisation of centres for microscopic analysis in order to ensure early diagnoses. 4. Recommendations for the organisation of the correct treatment of the disease. 5. Recommendations for the radiotherapeutical equipment of clinics. 6. Disadvantages of out-patient treatment. 7. Recommendations for the compilation of reliable statistics. 8. Recommendations for special scientific research.

The Commission also noted, as subject for inquiry, the available supplies of radium and the need for an authoritative opinion as to the advantages and drawbacks of distributing radium or radium emanations to hospitals and individual practitioners.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the 1927 statistics of six districts:—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Wiltshire C.C.. (299,500)	15·4	12·1	0·75	1·41	2·4	2·0	51	2·3	3·5
Sunderland C.B. (162,700)	22·4	13·8	1·38	1·10	3·2	1·8	94/41	14·2	4·7
Edmonton U.D. (71,279)	17·8	10·9	1·23	1·0	2·4	2·1	61	7·1	0·8
Doncaster R.D. (41,760)	24·1	9·8	0·76	0·74	2·2	0·8	76	7·9	3·9
Ramsgate B. .. (30,100)	15·0	15·0	1·10	2·0	2·9	1·7	69/33	4·0	0·0
Yeovil B.. .. (16,500)	14·7	10·9	0·54	1·09	1·9	2·2	49/37	0·0	8·2

Wiltshire.

Dr. Claude Tangye says there are still two obvious gaps in the county administration. The first is that children, apart from special cases, do not between the age of 1 year and school age receive the supervision which is urged by the Ministry. Provision has been made in the current estimates for an increase in the health visiting staff for this purpose. The second gap is in the tuberculosis scheme. Hospital facilities both for pulmonary and non-pulmonary tuberculosis are satisfactory but, owing to the inadequacy of the county medical staff, the supervision of cases in their own homes is only partially carried out in the Swindon area, which perhaps needs it most, being densely populated and industrial in character.

The deaths attributed to influenza numbered 313 and exceeded those from bronchitis (225) and pneumonia (188). The epidemic of influenza in the early part of the year accounted to a large extent for the higher death-rate as compared with the previous year, and also caused the closure of 159 schools. With modern ambulance facilities the present number of small isolation hospitals in the county could be reduced. The county council takes the responsibility of dealing with all cases of small-pox which may occur within the county, and the new hospital for the northern district at Ogbourne St. George is now complete.

The water-supply of the towns is good, but many of the villages are dependent upon wells which have become hopelessly polluted and others are dependent upon rain water only. The local authorities are awakening in the matter, and during the year inquiries were held with regard to the water-supply of three of the rural districts. In addition, the water-supply for the parish of Ashton Keynes, chiefly derived from numerous polluted shallow wells, is thought to be associated with the prevalence of intestinal worms among the children, an opinion which is said to have been confirmed by an inspector of the Ministry. As a result the rural district council is considering a scheme for the water-supply of this village. Pure water for these villages and for the farms is doubly important. In the first place, Dr. Tangye says ordinary typhoid fever is making its reappearance. There were 12 notifications during the year with three deaths. In the second place, compliance with the new Milk and Dairies Order is impossible without a pure water-supply, and there is, of course, a great milk industry in the county. The sewage disposal works have also received considerable attention. Of the effluents from 13 urban districts, 12 were classed by the analyst as fair or good, and one as poor. Of the effluents from 15 rural district works, nine were classed as fair to good, while two are described as not good, two as bad, one as very bad, and one as very foul. The Staverton Milk Factory pollutes the Avon in the Melksham district and a very foul effluent is from the Netheravon works, which are under the War Department.

Council houses have been erected in every district except Malmesbury U.D. and Chippenham R.D., and the Chippenham R.D. Council have now decided to build. The Housing (Rural Workers) Act came into force on Dec. 15th, 1926, and up to the end of 1927 20 applications were received. In eight cases grants were approved totalling £1455, and a loan of £100 was made, but two of these applications were withdrawn. Of the remaining 12, ten were refused, one is under consideration, and a grant of £100 was made in 1928 for the other. This Act, says Dr. Tangye, provides the first real opportunity open to county councils for direct help in the improvement of housing conditions, and few counties have wider scope for its operation than Wiltshire.

The follow-up of tuberculous milk samples reported by outside authorities is doing something to eliminate tuberculous cows from the Wiltshire herds. Thus, 22 complaints received resulted in the inspection of 32 farms and the discovery of 19 tuberculous cows. Reports from the London County Council of the premature death of many of the inoculated guinea-pigs led to an investigation of the conditions at other farms with the discovery of dirty conditions of the udder and abscesses, and incidentally of one more tuberculous cow. No satisfactory explanation, however, was found to account for the deaths of the guinea-pigs. The county council is also taking samples of milk for bacteriological examination, and following up bad results by veterinary inspection of the farms. In this way four more tuberculous cows were weeded out.

The county council is offering the assistance of its medical and nursing staff to local authorities, who are prepared to undertake the immunisation of children against diphtheria. Seven cases of encephalitis lethargica, six of which proved fatal, were notified, as compared with 20 in 1926. The county council have decided to pay the cost of a locum tenens for one month to enable a midwife, on the application of a local nursing association, to attend a post certificate course; and they have also arranged to supply pelvimeters at a special rate to the midwives for antenatal work. The midwives sent for medical aid in 26 per cent. of their cases. The doctors' fees paid by the county council amounted to £669, of which £244 were recovered from the patients, the balance being divided between the county rate and the Government grant.

The health visitors inspect boarded-out children for all the boards of guardians in the county except three. Dr. Tangye regrets that this scheme has not been accepted universally, seeing that boards of guardians do not employ, as a rule, an experienced nursing staff for this work.

Sunderland.

Dr. A. S. Hebblethwaite presents his first annual report, having been in charge during the last seven months of the year. The unprecedented rainfall during the summer caused flooding in many of the low-lying areas and drew attention to the inadequacy of the sewer accommodation. Housing conditions in the older and more congested parts of the borough have been improved by the number of new municipal and private enterprise houses built, but the problem of housing the working classes in less crowded houses near their work remains. The work in the light treatment clinic has been increased and arrangements have been made for treating children under the age of 5 years.

Dr. Hebblethwaite especially draws attention to the heavy death-rate from respiratory diseases. Tables are given, which show that since 1918 the pneumonia death-rate in Sunderland has been more than 50 per cent. higher than the English rate and that the bronchitis death-rate in Sunderland has been double the English rate. Of the 249 deaths from pneumonia, 140 were children under the age of 5. Dr. Hebblethwaite hopes that more children suffering from pneumonia will be accommodated in the municipal hospital in future.

Sunderland is now, practically speaking, a water-carriage town, and it is hoped that before long a standard dustbin will be provided for every house under the local Act of 1927. There are now only eight cowkeepers within the borough, keeping approximately 120 cows which are inspected quarterly by the veterinary surgeon.

There were 47 cases of small-pox notified with one death at the age-period 45–65. An outbreak at a common lodging-house with 90 male inmates caused considerable trouble owing to the refusal of vaccination by the contacts. The first case was removed on Sept. 13th, the second on Sept. 17th, the third on Sept. 30th, the fourth on Oct. 8th, the fifth on Oct. 9th, and the sixth and seventh on Oct. 10th. After each removal thorough disinfection was carried out and the lodging-house was closed to new applicants from Sept. 13th. After the last removal most of the contacts who needed vaccination accepted it. Eight cases were notified from the Highfield Poor-law Hospital, and the remaining cases occurred in various parts of the borough. There were 11 notifications of encephalitis lethargica, and ten deaths from this disease, five of which were of cases notified in the previous year. Of the 11 cases notified in 1927, five cases died in 1927, one in 1928, four are still suffering from some disablement, and one has recovered.

Edmonton U.D.

Dr. H. W. Harding describes his district as one of the dormitories of London, from which many of the inhabitants travel to town daily. The greater portion of Edmonton is in the valley of the Lee and only slightly higher than its waters, and Dr. Harding suggests that such a site may be responsible for throat affection, enlarged tonsils, and endemic diphtheria. Housing conditions are far from satisfactory. There is still overcrowding and there are various blocks of houses which should be dealt with as soon as circumstances permit. The day nursery registered 7000 attendances. The cost was about £960, of which about £220 was paid by the mothers in fees. The nursery also takes, as residents, the children of mothers who have been taken from home owing to illness; and the full number of 180 school-girls attended the mothercraft classes during the year. The Education Committee contributes £50 to the funds of the nursery in return for the holding of these classes. The joint orthopædic clinic, which provides treatment for crippling defects in children under 5 years and of school age, is conducted by Mr. J. B. Barnett, of the Royal National Orthopædic Hospital, and operative treatment, when necessary, is carried out at Stanmore Hospital. By arrangement with the guardians the maternity wards of the North Middlesex Hospital are used for municipal patients. The fee charged to the council is 6*s.* per day and the order for admission is signed by Dr. Gertrude Outram, who is in charge of the antenatal clinic. The same hospital has also provided, since early in 1927, artificial sunlight treatment for cases of rickets and marasmus.

Doncaster R.D.

Dr. A. B. Dunne says the needs of the district have long since outgrown the existing accommodation of the Doncaster Royal Infirmary and a contract has been signed to build the first block of the new infirmary on a spacious site on the Thorne-road, Doncaster. Dr. Dunne refers to a difficulty caused by speculators buying land and builders erecting a large number of small houses with the assistance of the Government subsidy. These houses have been passed by the council with the drainage emptying into cesspools and the duty of cleansing the cesspools falls on the owner or occupier. The council are now taking steps to meet the difficulty by instituting sewage disposal works for the respective parishes, but the council's schemes must necessarily come later than the building schemes. Dr. Dunne also refers to the increase of atmospheric impurities owing to the growing number of colliery stacks and miners' houses. He suggests that the miner's house produces an exceptional amount of domestic smoke owing to the "home coal" allowance of 1 ton per month to each coal-miner. He looks to the chemists to provide a cheap and smokeless household fuel as a remedy. Dr. Dunne also wonders, in view of universal baths, for how many years the red sandstone can be tapped without encroaching on its capacity, and states that the level of the water in several of the deep boreholes has been lowered. There were 118 notifications of small-pox with one death. The one death was that of a woman of 61, who had been vaccinated in infancy and contributory causes of her death were phlebitis and "petit mal."

Ramsgate.

Dr. W. J. Bannister reports a rainfall of 30·1 inches and a sunshine record of 1647·1 hours. He enumerates the advantages of Ramsgate as a health resort and mentions that a certain number of parents take up their residence in Ramsgate with the object of restoring their delicate children to robust health. From the high infant mortality-rate and the school report one gathers that insufficient attention is given to the children of the normal population. There are nine public elementary schools, of which only the two provided by the education authority and one of the "non-provided" are satisfactory, while in the case of the other six faulty design and unsuitable situation leave much to be desired. This state of affairs, no doubt, makes Dr. Bannister's plea for an open-air school and open-air classes all the year round the more urgent. Verminous conditions give trouble in the schools. There are no school baths and there is no organiser of physical training. Dr. Bannister also pleads for the formation of classes with a view to corrective exercises for postural defects. Each of the four health visitors carries out all the health visiting and school work in the area allotted to her. At the end of the year 198 of the 352 houses in the council's scheme had been provided and contracts had been made for the erection of 38 parlour and 104 non-parlour houses, of which the latter will help to remove the pressing need for housing accommodation at low rentals. During the year an improvement scheme for an unhealthy area was approved by the Ministry.

Yeovil.

Dr. C. W. Gee reports that the staple industry is the manufacture of leather gloves, including all

processes from the preparation of the raw hides. The water-supply is not sufficient during dry periods for the area supplied, and the council have obtained powers to sink a new well in the greensand at Cattistock, from which an additional daily supply of 500,000 gallons is expected. Very few houses in the borough are provided with sanitary dustbins and a great nuisance is caused by the blowing about of refuse on windy days.

There were 243 births and 52 expectant mothers attended the antenatal clinic. The general standard of housing is fairly good, but there are many worn-out houses which cannot be made reasonably fit for habitation and which would be condemned under normal conditions. Of 191 new houses erected, 168 formed part of a municipal scheme.

SCHOOL MEDICAL SERVICE.

Name of district.	No. on roll.	Average elementary school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.†
Shrewsbury	3,900	—*	1,575	6,586	10·3
Bootle ..	12,010	10,804	3,751	12,705	22·5
Taunton ..	2,827	2,616	793	2,404	18·4

* Not given. † Excluding dental defects and uncleanliness.

Shrewsbury.

By the reorganisation of his present nursing staff and the addition of another nurse Dr. A. D. Symons proposes to conduct an increasingly intensive campaign against personal uncleanliness, which perhaps more than any other single condition indicates parental ignorance or neglect.

This reorganisation will coördinate the maternity and child welfare work with the school service by enabling each nurse to carry out all the nursing duties of both services in her own district. In summarising the results of his work for the year Dr. Symons has taken the opportunity of pointing the way to achieve further improvements in the health of the children of Shrewsbury. His proposals include better ventilation and lighting in the schools and bigger playgrounds with shelters for open-air classes, and he has published a special memorandum on "The School Building in Relation to Health," in which his ideas are clearly set out. The provision of milk and cod-liver oil for necessitous children has been justified by their increase in height and weight. The need for further dental assistance will be met by additional dental sessions. Close coöperation exists between the S.M.O. and the organisers of physical training not only in the arrangement of games and sports, but in the supervision of remedial exercises where these are necessary. Acknowledgment is made of the cordial help of teachers, attendance officers, and voluntary associations. That Dr. Symons's good work is appreciated by the parents is shown by the increasing numbers who attend medical examinations and clinics.

Bootle.

Dr. F. T. H. Wood, S.M.O. and M.O.H., in his introduction to this report, points out that the functions of the local education authority go beyond the promotion of the mental development of the child and are actively concerned with his health and physical development. Medical inspection is conducted for the most part by Dr. Purser Davies, who also deals with maternity and child welfare. The tuberculosis officer, Dr. R. Hannah, also helps in medical inspections and at a minor ailment centre. Dr. Wood himself occasionally conducts routine examinations and undertakes the medical work in connexion with the special classes and the Mental Defective Act cases. Meals are provided by the school canteen committee, of which the S.M.O. is a member; this committee has control of a useful fund for providing needy children with clogs during the winter months.

The remedial exercises clinic is supervised by the S.M.O. with the coöperation of an orthopædic surgeon; this clinic deals with mouth-breathers and cases of minor spinal curvature, as well as more definite pathological conditions. The special interest taken by the local authorities in physical development is shown in a further grant of £200 for expenditure on apparatus, and the appointment of a special (playing fields) subcommittee to find suitable playing accommodation. A striking improvement in personal cleanliness and in the attendances at the minor ailment centre is recorded this year, also a reduction in the percentage of most of the physical defects. The hygiene of the mouth and teeth is the subject of a booklet which has been prepared by the Dental Board and circulated among head teachers with excellent results in this town. Teachers have been zealous in passing on information to the children, with the result that further dental assistance will soon be called for. It has not yet been possible to establish any special schools, but the children in the special classes for the dull and backward have been under the supervision of the S.M.O. and all have been individually examined.

Taunton.

In a small town facilities such as clinics and special schools are difficult to establish, but a compensating advantage is that since nearly all the health work is directly under one person coördination is excellent, and intimate contact with parents can be secured. In Taunton Dr. J. Allen, who is in charge of public health, school inspection, and infant welfare clinics, gets a high percentage of parents (72 per cent.) to attend the medical inspections. Moreover, the fact that one person serves both as school nurse and attendance officer leads to the early discovery of infectious and other diseases. The dentist, Mr. A. J. Percy, states that both parents and children are becoming more favourably disposed toward the idea of having teeth filled rather than removed. This preference is a feature of the practice at Taunton, for with permanent teeth the fillings (594) are over eight times as many as the extractions (72). The dentist anticipates that every year 50 per cent. to 60 per cent. of the children will need treatment; but in view of the thorough and prompt work now being done some reduction may, we hope, be looked for.

Taunton is spared some of the disadvantages of a small town, since it is the headquarters of several institutions belonging to the county of Somerset—for example, the orthopædic clinic of the county council is open to the children and the infants of the borough, as is also the tuberculosis dispensary. The occupation centre of the Somerset Association for Mental Welfare is available for low-grade mentally defective children. Dr. Allen mentions that this valuable institution is in urgent need of more local support.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 23RD, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 230 (last week, 282); scarlet fever, 1716; diphtheria, 969; enteric fever, 54; pneumonia, 769; puerperal fever, 47; puerperal pyrexia, 100; cerebro-spinal fever, 10; acute poliomyelitis, 9; acute polioencephalitis, 2; encephalitis lethargica, 31; dysentery, 8; ophthalmia neonatorum, 117. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified from the following 21 counties: London, 11 (Bermondsey 1, Hackney 1, Southwark 1, Wandsworth 8); Bedford, 6 (Bedford 2, Luton 4); Derby, 28; Devon, 1; Durham, 62; Gloucester, 2; Hertford, 1 (Bishop's Stortford); Lancaster, 11; Middlesex, 1 (Wembley); Norfolk, 1; Northampton, 4; Northumberland, 14; Nottingham, 6; Soke of Peter-

borough, 1; Stafford, 16; Surrey, 1 (Godstone); Warwick, 2 (Coventry); Worcester, 1; Yorks, North Riding, 4; West Riding, 28 (last week 56); Glamorgan, 7; Monmouth, 22.

The numbers of cases of small-pox in London have declined during the last three weeks, the figures being 49, 24, and this week 11.

The number of patients in the Infectious Hospitals of the Metropolitan Asylums Board on June 26th-27th was as follows: Small-pox, 69 under treatment, 7 under observation; scarlet fever, 1781; diphtheria, 1979; enteric fever, 18; measles, 600; whooping-cough, 152; puerperal fever, 21 (plus 19 babies); encephalitis lethargica, 68; poliomyelitis, 1; "other diseases," 24. At St. Margaret's Hospital there were 14 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were 6 (0) deaths from enteric fever, 34 (8) from measles, 5 (4) from scarlet fever, 48 (7) from whooping-cough; 29 (8) from diphtheria, 36 (12) from diarrhœa and enteritis under two years, and 31 (3) from influenza. The figures in parentheses are those for London itself.

The six fatal cases of enteric fever occurred at Hornsey, Bath, Ashton-under-Lyne, Huddersfield, Halifax, and Newcastle-on-Tyne.

The number of stillbirths registered during the week was 258 in the great towns, including 38 in London.

Correspondence.

"Audi alteram partem."

THE EARLY DIAGNOSIS OF CANCER OF THE COLON AND RECTUM.

To the Editor of THE LANCET.

SIR,—Dr. A. F. Hurst, in the admirable paper published in your issue of June 23rd, puts forward a plea for a definite diagnosis of malignant disease of the colon with view to early, and therefore probably more successful, operation. But even when the patient first complains of suspicious symptoms it may be already too late, and all physicians must have met with cases in which the disease had certainly been in existence for a long time without very marked symptoms. A striking case in point recently occurred at the Italian Hospital. A woman, aged 49, was admitted under my care on June 23rd. She was well nourished and had "enjoyed good health" all her life. She had no abdominal symptoms whatever until a week before admission, when she began to suffer from flatulence and constipation, which became complete two days before admission. The abdomen was somewhat distended, but not tender or rigid; there was no fever, no pain, no vomiting, the pulse and general condition were good. Per rectum nothing could be felt. Castor oil and high enemata failed to produce any evacuation and, since the patient vomited once, and colicky pains appeared, laparotomy was performed by Dr. Lwow, the resident medical officer. On opening the abdomen, gas escaped and free purulent fluid was found. A mass of malignant disease completely constricted the upper part of the sigmoid and a mass of glands in the pelvic mesocolon. The bowel was ruptured above the seat of the disease! A provisional diagnosis of sclerosing cancer in some part of the intestines, with impaction of fæces above, had been suggested before the operation, but no one who saw the case was prepared for the gross and catastrophic lesions which must have existed for a long time previous to her admission without causing any symptoms to arouse the least suspicion.

I am, Sir, yours faithfully,

T. VINCENT DICKINSON.

Sloane-square, S.W., July 2nd, 1928.

A SIMPLE HOOKWORM LARVICIDE.

To the Editor of THE LANCET.

SIR,—The letter of Col. Clayton Lane in your issue of May 19th on the effect of common salt in destroying hookworm larvæ recalls an investigation carried out by me some seven years ago in an Indian salt mine.

As part of an inquiry ordered by the Government of India into the incidence of hookworm disease amongst miners (of all sorts), it became my duty to report upon the health of the miners employed in the Khewra Salt Mines, which are located in the Salt Range in the north of the Punjab. The health of this community was notoriously bad, and it was generally assumed that ankylostomiasis was mainly, if not solely, responsible. I accordingly set up a laboratory at Khewra and made a systematic examination of the health of the community, which included an examination of the fæces of a large proportion of the miners, and of their wives and families. To my profound astonishment, although the majority of the miners were found to be infected with one or more helminths, not a single ovum of an ankylostome worm was detected. It is now known somewhat more definitely than in the year 1921 that ankylostomiasis is not a common disease in the Punjab; but, as a result of recent observations at the Mayo Hospital, Lahore, at the Medical School at Amritzar and, more especially, of the helminth survey of India carried out by Dr. Chandler, of the Calcutta School of Tropical Medicine, it has been established that infection with ankylostome worms (not necessarily associated with clinical signs of ankylostomiasis) occurs with some frequency in the hill tracts of the Punjab and somewhat sparsely amongst the inhabitants of the plains. This being so, it is even more of a matter of surprise that a community, working under extremely unhygienic conditions and in an environment apparently favourable to infection (on account of great heat and humidity, work has to close down in the mines during the monsoon months, July to September), should escape completely. I made the suggestion in my report, which unfortunately was not published and which is not now available, that the heavy impregnation of the soil with common salt might exercise an inimical influence upon the hookworm larva during its extra-corporeal phase, and that this circumstance might be responsible for the remarkable immunity of the miners from ankylostomiasis.

Malaria was proved to be the chief cause of ill-health of the miners at Khewra, and no attempt was made to follow up the above suggestion or to determine, by experiment, whether it was well founded; but in view of the experimental work of Lambinet and others, to which Colonel Clayton Lane alludes, it seems certain that transmission of infection would be impossible in a soil heavily impregnated with salt and that this circumstance might account for the absolute freedom of the Khewra miners from infection. The free use of common salt in coal and other mines, where ankylostomiasis constitutes a menace to health, would thus appear to constitute, as Colonel Clayton Lane remarks, a simple and effective remedy for eradicating hookworm infection from mines; but surely one may go further and say that the use of common salt would prove equally valuable in all areas, such as the vicinity of latrines, where infection is peculiarly liable to be contracted.

I am, Sir, yours faithfully,

C. A. GILL.
Lt.-Col., I.M.S.

Simla, June 14th, 1928.

PERICARDIAL KNOCK.

To the Editor of THE LANCET.

SIR,—The case of pericardial knock described in your issue of June 16th by Dr. W. A. Lister recalls a certain soldier, whom I saw, in consultation, at the Bermondsey Military Hospital during the war. On

approaching the patient, and when still some yards from the foot of the bed, both his heart sounds could be heard clearly. There was no marked constitutional disturbance, so that the heart's action was not accelerated. The result was that the effect produced on the ear resembled that of a grandfather clock. The history was that this phenomenon had been observed for nearly two days. On examining the chest there was evidence of the presence of fluid on the left side, and an exploratory puncture was advised. The chest was not, however, explored, for a few hours later a bronchial fistula developed; the patient coughed up the contents of an empyema, and the heart sounds became normal. The fact that the conduction of the heart sounds disappeared when the pressure of the empyema was removed gives support to Lister's view as to the cause of their conduction—viz., that the sounds arise in the left pulmonary artery, that they are due to tension or distortion of that vessel, thus partially obstructing it, and that they are analogous to the sounds heard when estimating the blood pressure by auscultation. If this is the right explanation, the term "pericardial knock" seems to be a misnomer.

All the other cases have been in association with a wound of the chest—indeed no such case, prior to Lister's, appears to have been recorded in civilian practice. The loudness of the sounds also renders the Bermondsey case notable, for only in Munden's[1] patient, whose heart sounds could be heard 6 or 8 ft. from the chest, and for an hour only before death, was anything like the same loudness recorded. Maynard Smith[2] states that the sounds may sometimes be heard when standing at the foot of the bed, but he makes no reference to their having been heard further off than this. Finally, Rees and Hughes[3] state that the sounds could not be heard at a greater distance than a few inches from the chest in any of the cases which they had collected.

I am, Sir, yours faithfully,

H. E. SYMES-THOMPSON.

Wimpole-street, W., June 27th, 1928.

VARICOSE ULCERATION: ULTRA-VIOLET LIGHT AND UNNA'S PASTE DRESSINGS.

To the Editor of THE LANCET.

SIR,—In answering Dr. Weinbren's criticism in THE LANCET of June 23rd, of my paper on varicose ulcers in the number of May 5th, I must express my regret that some of the points at issue relate to figures in the statement of details (Table C) which unfortunately had to be omitted for reasons of space. This table, as was noted in a footnote to my article, is available for inspection by anyone interested.

1. It is stated in my paper that a relatively large proportion of suberythema doses were given because the ulcers having them "on the whole ran a more favourable course than those having stronger doses." In other words, the smaller percentage of stronger doses is directly referable to their inefficacy. In those cases in which they were used (in 83·8 per cent. of 31 cases for the air-cooled, and 19·3 per cent. for the water-cooled lamp) they were abandoned after what was, in my judgment, a reasonable trial of consecutive doses when, and only when, there appeared to be no justification for their continuance. Since Dr. Weinbren does not give the total number of doses concerned in his calculation, the percentages convey very little. Ten per cent. of doses with the water-cooled lamp in a total of, say, 1000 doses, would represent a very appreciable trial, whereas 10 per cent. of 10 doses would indeed be negligible.

2. The ulcers were treated twice or thrice weekly except, as stated, in the few cases in which an unusually strong dose was given. The figures of duration of the light treatment in the addendum have doubtless misled Dr. Weinbren, because they relate to the whole period during which no treatment other than ultra-violet was given, and they therefore include in certain cases deliberately planned intervals for observation between sets of consecutive doses. It was always possible that intermittent treatment would be actually beneficial when the results of continuous treatment were unsatisfactory. The scheme of dosage would have been more clearly seen had I indicated when these intervals occurred, even at the risk of making the table still more cumbersome. Without this indication an accurate analysis on the lines attempted by Dr. Weinbren is in no way possible.

3. I greatly regret the oversight which led to the omission of the unmeasured ulcer, which "covered three-quarters of the leg," from the irradiated series. The addendum shows that this ulcer was not treated with Unna's paste; the surgeon-in-charge advised amputation.

I can see no indication in the report that the "worst ulcers" were treated with Unna's paste. If this assumption is based on the fact, as stated, that the area of the largest ulcer in the Unna series was greater than in the light series, then the omission to which I refer above is sufficient to upset it. Since the figures of the average size which Dr. Weinbren gives "may," by his own admission, include whole ulcers, where only a part was treated, I can hardly accept them. In any case, my work has not given me the impression that the worst ulcers, within limits, are necessarily the largest. The rate of healing may be more rapid in large than in small ulcers, and the last stages are often the most intractable.

4. The ambulatory cases receiving irradiation wore no support other than their ordinary bandages, in order that the issue might not be confused by the simultaneous adoption of two lines of treatment. The evidence of the healing which occurs with Unna's paste clearly shows the fallacy involved in attempting to judge the effect of synchronous treatment when the veins are well supported. Dr. Weinbren himself, in the last number of the *British Journal of Actinotherapy* (I quote from memory, as I am away from home), expresses the opinion that the rate of healing under ultra-violet light is to some extent dependent on the use of adjuvant factors. I agree with him. That is what my experience has taught me; but his adjuvant factor is my essential factor.

I am, Sir, yours faithfully,

June 24th, 1928. DORA C. COLEBROOK.

[1] Munden, W. H. P.: Brit. Med. Jour., 1918, i., 175.
[2] Smith, S. Maynard: Ibid., 1918, i., 78.
[3] Rees, W. A., and Hughes, G. S.: THE LANCET, 1918, i., 55.

REMOVAL OF THE RIGHT CEREBRAL HEMISPHERE IN MAN.

To the Editor of THE LANCET.

SIR,—In your interesting annotation in THE LANCET of June 30th (p. 1337) it is stated that in Dandy's successful case of removal of the right cerebral hemisphere "hearing remains normal in both ears, a finding which disposes of the assumption that there is cortical representation for hearing in the right temporal lobe." This inference, as I understand it, is not deducible from the facts which really go to support the assumption or, rather evidence, that there is cortical representation on each side for both ears. In support of this I would quote the late Sir Frederick Mott's case of a woman in which a vascular lesion of the left cortical centre led to word-deafness, from which she recovered and got married. She unfortunately sustained a vascular lesion of the right cortical centre and only then became quite deaf. Karl Grahe's pathological investigations on central disturbances of hearing[1] showed that in damage to one cortical centre hearing for speech is only slightly diminished, the diminution being more marked in the ear opposite to the lesion.

[1] Zeits. f. Hals- Nas.- u. Ohrenheilk., 1923, vi., 498.

The representation of each cochlea in both cortical centres is unquestionable and indispensable; for if, for instance, the left cortical centre were in connexion with the right ear only we would presumably find ourselves afflicted with word-deafness if this ear were stopped up, which is obviously absurd.

It is, therefore, quite natural that the loss of the right cerebral hemisphere should not involve deafness of either ear. The loss of the *left* hemisphere would no doubt (in a right-handed patient) entail "word-deafness," if only for a time, as in Mott's classical case.

I am, Sir, yours faithfully,

London, July 2nd, 1928. JAMES DUNDAS-GRANT.

ACUTE APLASTIC ANÆMIA.

To the Editor of THE LANCET.

SIR,—In referring to the treatment, followed by recovery, of the case of this hitherto rapidly fatal disease recorded in my book, your reviewer (THE LANCET, June 23rd, p. 1285) states that "numerous therapeutic products of one sort and another" were used, and suggests that, therefore, it is impossible to assess the part played by injections of liver substance. This conveys the impression that the treatment was of the "blunderbuss" type. Over a period of 3½ months three treatments were used (if we exclude such medicaments as rhubarb and soda, calomel, and the mild measures directed against the intestinal infection, none of which can have had any effect on blood regeneration). These treatments were hemostyl, liver substance, and vaccines. The stock vaccines were given sporadically to combat complicating catarrhal infections. Diet can be excluded as a factor, since the child was on a dietetic régime supervised from birth and, if anything, the diet was less adequately supplied with vitamin A and fats during the illness than before it—a point dealt with by me in criticising Koessler's views regarding the importance of these substances in blood regeneration. We are left with hemostyl and liver substance as therapeutic measures, and the alternative possibility of spontaneous recovery. This last can be ruled out by the fact that no case of recovery from *acute* aplastic anæmia has been recorded. The two cases quoted from my book by your reviewer were of chronic aplastic anæmia and were introduced to support my argument regarding a liver hormone-organ controlling blood production. One of them could only be traced for 12 months after the reported recovery, and the other (Gibson's case) has not completely recovered, and was still under treatment with an abnormal blood count some months ago. My case is now running about and apparently normal, having had no liver treatment (except for one week in May) since February.

Treatment by hemostyl and by liver substance only overlapped for three days—i.e., from Nov. 5th to 8th. In spite of the reaction in the platelet system during hemostyl treatment, the other marrow-formed elements continued to descend, the polymorphs reaching one of the lowest counts recorded in the literature. After five days of liver treatment regeneration was observed. The total number of the polymorphs was taken as the index of efficacy of the treatment throughout, and their curve closely followed the dosage curve. The reticulocyte count to which others attach so much importance (following the lead of the Americans), was not used, mainly because its value is more qualitative than quantitative, and it cannot therefore be as serviceable a guide to dosage. Throughout the period of liver disturbance the total polymorph count shows a quantitative relationship to the amount of liver substance injected, and was a most valuable guide to dosage. Armed with the convictions tentatively put forward in my book, I have since treated a number of cases of varying degrees of depressed bone-marrow function with injections of liver substance; the results, which will be published later, are most gratifying.

Others have proclaimed the uselessness of liver therapy in aplastic anæmia. The recorded data upon which this misleading pronouncement is based are inadequate and unscientific. Masses of liver by the mouth, even concentrated extracts by the mouth, are a crude form of treatment compared to hypodermic medication. Successive blood counts, unless taken at the same time each day in a particular case, are not a true indication of progress, particularly in children. Counts done by different individuals on the same patient increase the margin of error due to the personal equation and cannot be compared with counts done by a single skilled pathologist; this especially applies to platelet counts. When one contemplates the helplessness of the physician confronted with this dreadful illness a life-saving measure, which at least has the merit of simplicity, is deserving of respect.

I am, Sir, yours faithfully,

Bradford, June 28th, 1928. A. HAYES SMITH.

ENCEPHALO-MYELITIS FOLLOWING VACCINATION.

To the Editor of THE LANCET.

SIR,—In a recent letter in your columns we reported six cases of acute meningo-encephalo-myelitis, with the statement that these cases "differed in many respects from acute epidemic encephalitis and showed a marked clinical similarity to post-vaccinal encephalitis." Prof. Ledingham, writing on June 16th, states that this "would imply that this latter affection possesses a more or less stereotyped symptomatology." We cannot agree that our letter contained such an implication, and we are as familiar as Prof. Ledingham with the variability of the clinical pictures. Our six cases present this variability in a striking manner. Thus we state that "cervical rigidity and Kernig's sign were present in four cases and trismus in one. . . . Aphasia was noted in two cases, quadriplegia in one, hemiparesis in one, and in one the principal signs were those of a myelitis." The variability of our cases, in fact, appeared to us to be a further point of resemblance between them and post-vaccinal encephalitis.

It is a matter of general experience that many diseases present an extremely variable clinical picture. This is notably the case with encephalitis lethargica and with disseminated sclerosis, but this fact does not debar us from regarding them as clinical entities and from speaking of resemblances and differences between them.

We are, Sir, yours faithfully,

DONALD HUNTER.
W. RUSSELL BRAIN.

London Hospital, Whitechapel, E.,
July 2nd, 1928.

GLASGOW HOSPITALS.—On Friday in last week the Prince of Wales attended one of seven performances of a Scottish historical pageant in the grounds of Garscube House, Glasgow, in aid of the building fund of the Incorporated Glasgow Dental Hospital. Many of the characters were impersonated by their descendants. The existing hospital premises have been condemned as "a derelict dwelling-house" and insanitary, with no possibility of making provision for dental research.—The annual report of the Glasgow Royal Hospital for Sick Children states that the number of in-patients has grown from 1089 in 1907 to 7143 in 1927, and the out-patients' attendances from 42,302 to 83,591. In 1907 the ordinary expenditure was £7861; last year it was £38,039. The first part of the programme of enlargement has now been completed, and the provision of better accommodation for the nurses and domestic staff has made two more wards available for patients. Progress will now be made with the new admission block, which will not only provide for a greatly increased number of out-patients but will provide space on the upper floors for nearly 100 patients. A lecturer on biochemistry in relation to infancy and childhood is about to be appointed in the University of Glasgow, and he will be biochemist to the hospital and work in its laboratory. It is also hoped shortly to establish a research lectureship on the pathology of the diseases of infancy and childhood. The endowment of £15,000 for this purpose is being provided by Mr. William G. Gardiner and Sir Frederick Gardiner.

Obituary.

EDGAR MARCH CROOKSHANK, M.B. LOND.,

EMERITUS PROFESSOR OF COMPARATIVE PATHOLOGY AND BACTERIOLOGY, KING'S COLLEGE, LONDON.

WE regret to announce the death of Dr. E. M. Crookshank, which occurred on Sunday last, July 1st, at his country house, Ridge Hill Manor, East Grinstead, in his seventieth year.

Edgar March Crookshank, the son and grandson of soldiers, from school age showed a bent towards natural science. He was educated at King's College School and, proceeding to the hospital, obtained the diploma of M.R.C.S. in 1881, graduating in medicine at the University of London three years later. His career as a student was distinguished, for he gained both exhibitions and scholarships at King's College, while he won the gold medal in anatomy in the examination for the London M.B. Lister arrived in London to take up his appointment at King's College Hospital at the time when Crookshank was completing his training. The Listerian doctrines were practised more rigidly at King's than at any hospital in the metropolis, and Crookshank, one of Lord Lister's dressers, acted as house surgeon to the institution. Owing to this fact, as much as to certain family influence, Crookshank was selected for special duty in the Egyptian Expedition of 1882; he was present at the battle of Tel-el-Kebir, and received the Khedival Star and other decorations.

Following on his experiences of antiseptic surgery in military campaigning, of which he wrote at the time a very sound account, Crookshank decided to make the study of bacteriology his professional career. He proceeded to Paris, where Pasteur, who had already made his famous studies on fermentation, was at work on the problems of rabies, and welcomed the pupil of Lister. Thence he went to Berlin, and studied under Koch, at that time Director of the Institute of Health, and engaged in perfecting his original discoveries in relation to tuberculosis. The result was the publication by Crookshank, in 1886, of a "Manual of Bacteriology" which met with a good reception on its appearance, and secured for its writer the professorship of bacteriology at King's College. Here he founded the laboratory for human and veterinary pathology and did much educational work in connexion with these subjects. He wrote largely and taught energetically, and showed considerable independence of attitude. For example, with regard to vaccination, he followed the lines laid down by that great historian of epidemiology, Charles Creighton, but he attempted also to find grounds of his own for dissent from much accepted teaching. In many places his criticisms of popular conceptions were no doubt sound, and this would to-day be admitted, but he was not able to make converts through his own reasoning to the views which he proposed to substitute. He retired from active work at King's while still a young man, and it is over 30 years since the fourth and last edition of his text-book of bacteriology appeared. But by that time the work was no longer up to date, in spite of reconstruction, revision, and enlargement. In its day, however, it was a valuable contribution to the literature of what was still a new subject; it was inclusive—ambitiously so; it was well illustrated, both by original illustrations and by loans from the best sources; it was furnished with appendices, in which practical instructions were given as to the fitting-up of the laboratory; and it had a bibliography through which readers could obtain a real introduction to French and German literature.

On his resignation of his post as active professor in 1889, he was given Emeritus rank and elected a Fellow of King's College: but he carried into retirement a keen interest in medical and especially veterinary problems, while his interest in local administration was widely manifested. In 1894 he was appointed J.P. for Sussex, and became at once an active member of the Bench, taking a prominent part in the public life of the district, while he stood for the East Grinstead Parliamentary Division of the County as a Unionist. He took, further, advantage of all opportunities for travel always combining his sporting proclivities—and he was an accomplished hunter of big game—with careful investigations into the various social problems of the places which he visited, and these included South Africa, Australia, Canada, and the West Indies. Thus he familiarised himself with the productive powers of most of the countries under our Colonial administration. All these experiences confirmed him in his deep interest in veterinary surgery, manifested early in the circumstances of the founding of the bacteriological laboratory at King's College. He was for nearly 40 years one of the governors of the Royal Veterinary College, and presided at different times over the committee of management of the Research Institute and of the General Purposes Committee, and took a prominent part in the appeal for rebuilding the present College in Camden Town.

Prof. Crookshank married, in 1885, Harriet, only daughter of Thomas Colfax, J.P., of Bridport, by whom he had two sons and three daughters.

HENRY HANDFORD, M.D. EDIN., F.R.C.P. LOND., D.P.H.

Dr. Henry Handford, who died on June 24th at the age of 73, long played an important part in the public life of Nottingham and its county, first as clinician and later as administrator. A son of Dr. Thomas Handford, who practised at Atherstone, in Warwickshire, he was educated at the University of Edinburgh, where he proved a brilliant student, winning University medals in physiology, pathology, medicine, clinical surgery, midwifery, and other subjects. After graduating as M.B., C.M. with honours in 1878, he took up an appointment as medical tutor at Queen's College, Birmingham. It was not long, however, before he decided to settle in Nottingham, and as physician to the General Infirmary he soon won a high reputation for wide learning. Though he read extensively, his knowledge was chiefly his own, acquired by diligent observation and exact examination of his patients. The signs and symptoms which they presented were always interpreted as far as possible in the light of the most recent pathological knowledge available, and Handford was himself a careful student of pathology. As an illustration of his methodical research we may recall a demonstration before the Nottingham Medical Society in 1884, when he showed numerous pure cultures of pathogenic organisms, and in the following year when he showed microscopical preparations of *Bilharzia hæmatobia* and sections from cases of choreic insanity, myelitis, actinomycosis and supposed malignant pustule. This list is evidence of the wide range of his interests, and their catholicity is further shown by the titles of papers read before the Pathological and Clinical Societies of London, of which he was a keen member. In 1904 he described a case of heart-block and demonstrated the causative lesion, a gumma in the bundle of His; and many papers in medical journals bore witness to his special interest in cardiology. In 1899 the value of his contributions was recognised by his election as a Fellow of the Royal College of Physicians of London, of which he had become a Member in 1885. Seven years later he resigned his post of honorary physician to the General Hospital on being appointed medical officer of health for the county. In this new work he displayed the same thoroughness, conscientiousness, and courtesy to those with whom he worked, but his friends could not but regret the loss to clinical medicine in the city. During his 26 years of office he found much to do for the welfare of the county, and also served a term of office as president of the Midland Branch of the Society of Medical Officers of

Health. "Those who knew him well," writes a colleague, "admired him equally for his excellence as physician and for his qualities as a man. No one could be more kind and courteous than he was at all times and under all circumstances: there was about him a sort of refined dignity of bearing which compelled respect. A love of literature and music and a great hatred of any approach toward untruthfulness completed the picture of the truly cultured gentleman."

Dr. Handford married a daughter of the first Lord Belper, and she survives him. His two sons were killed on Jan. 1st, 1916, at the Hohenzollern Redoubt.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

DUTY ON SCIENTIFIC FILMS.

On Tuesday, July 3rd, the House of Commons went into Committee on the Finance Bill, Mr. J. F. HOPE, Chairman of Committees, in the chair.

Captain FRASER moved a new clause to exempt from duty films recording scientific investigations or research which are imported into Great Britain or Northern Ireland when the Commons were satisfied that the films would not be sold or hired or publicly exhibited for profit. He said that the man who had carried out researches with a microscope, or in other directions of a scientific, and particularly of a medical-scientific kind, now found it possible, through the technique which had been developed, to record those researches and investigations upon a film instead of upon paper. The free interchange of the results of these investigations was something which no taxation should be allowed to impede.

Dr. DRUMMOND SHIELS seconded the new clause. He said that, even in the few years since 1925, the importance of these scientific films had considerably increased. Many of them had originated in America, Germany, and other countries, and they had proved most valuable for teaching and scientific purposes. There ought to be free trade in all that appertained to science and research. The only possible objection he could see was that of administration, but it should be possible for the scientific bodies to which such films would be consigned to give a certificate which would make it possible to work this exemption without causing much administrative difficulty. He hoped that the Chancellor of the Exchequer would receive the proposal in a sympathetic spirit.

Mr. A. M. SAMUEL (Financial Secretary to the Treasury) said that this clause had received the most careful consideration, with a desire, if possible, to give effect to it. It had been found, however, that, in these days of popular science, it would be impossible for the Revenue authorities to distinguish the scientific films from those which could be shown in the ordinary way, and to be sure that the former were not subsequently shown in picture-houses.

Captain FRASER assured the Chancellor of the Exchequer that the films to which the clause referred were only of scientific interest and were in no sense of the word "popular."

Mr. CHURCHILL said that while he could give no undertaking in the matter, he would see that the facts were examined again. Those responsible for making that inquiry would receive any further evidence that Captain Fraser might bring forward.

The proposed clause was then withdrawn.

HOUSE OF LORDS.

THURSDAY, JUNE 28TH.

Dogs Act (Amendment) Bill.

The Earl of CRANBROOK moved the second reading of the Dogs Act (Amendment) Bill which has passed through the Commons. The measure, he explained, extended the liability of the owner of a dog which did injury to poultry. The Bill also dealt with the delivery of stray dogs to the police.

Viscount BERTIE of THAME pointed out that whereas under the principal Act no dogs could be sold for vivisection, found dogs under this Bill were not so protected. In Committee he would move an amendment to bring the Bill into line with the present law in that respect.

The Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 27TH.

Small-pox in England and Wales.

Mr. SHEPHERD asked the Minister of Health the number of cases of small-pox reported for England and Wales for the latest week available; and the number of cases discovered amongst casuals during any convenient period.—Mr. CHAMBERLAIN replied: The provisional number of notifications of cases of small-pox in England and Wales for the week ended June 23rd last was 230. I have no precise information as regards the latter part of the question, but during the period Jan. 24th to June 25th, 1928, 124 cases of small-pox have been reported among casuals.

Health Insurance Benefits and Outdoor Relief.

Mr. LANSBURY asked the Minister of Health what instructions, if any, he had issued to his inspectors and to public auditors in connexion with poor-law relief to persons in receipt of national health insurance benefit; and whether he was aware that his officers and certain auditors were forcing boards of guardians to take into account health insurance benefits when assessing outdoor relief, despite the fact that the Insurance Acts expressly provided that boards of guardians should not take health insurance payments into account when assessing the need of applicants for poor-law assistance.—Sir KINGSLEY WOOD replied: My right hon. friend has given no instructions of the kind suggested in the first part of the question. The answer to the second part is in the negative. I would, however, remind the hon. Member that boards of guardians are only precluded from taking into account health insurance benefits up to 7*s.* 6*d.* a week.

Inspector of Medical Supplies.

Mr. JOHN PALIN asked the Secretary of State for War whether the inspector of medical supplies employed at the War Office was a qualified pharmacist; and whether it was part of the duties of the inspector of medical supplies employed at the War Office to pay periodical visits to the medical store depôts for the purpose of inspecting medical supplies and of ascertaining whether due care was being exercised in respect of the storage of such medical supplies.—Sir L. WORTHINGTON-EVANS replied: The inspector is qualified; there is only one Army medical store depôt; it is not part of his duty to inspect it.

Mr. PALIN also asked the Secretary of State for War whether the advice of the inspector of medical supplies had been taken as to what medicinal preparations used by the Army could be conveniently and economically prepared in the dispensing laboratories of Army hospitals.—Sir L. WORTHINGTON-EVANS replied: Yes, sir.

Silicosis and Workmen's Compensation.

Mr. WILLIAM HIRST asked the Home Secretary the total number of claims at the latest available date under the Workmen's Compensation Act, in connexion with the silicosis scheme, by July, 1927, and the number as affecting Birmingham and Sheffield respectively.—Sir WILLIAM JOYNSON-HICKS replied: I presume the hon. Member refers to the scheme for the metal grinding industries which came into operation on July 1st last year. I regret that I am unable at present to give any figures, but information as to the number of cases in which compensation was paid under this scheme during the six months, July to December, 1927, is being collected and will be available later.

THURSDAY, JUNE 28TH.

Allowances to Mentally Deficient Orphans.

Sir RICHARD LUCE asked the Minister of Pensions if he would consider the possibility of extending benefit under the Pensions Act to the orphan children of pensioners who were mentally or physically deficient after they reached the age of 21.—Major TRYON replied: I have no authority under the Royal Warrants to continue allowances, which normally cease at the age of 16, beyond the age of 21. I have, however, taken, and am taking, measures within my powers, and without encroaching on the obligations of local education and health authorities in the matter, to coöperate with other agencies in securing such suitable treatment or training of the children before they reach the age of 21 as will enable them as far as possible to contribute to their own support.

Medical Inspection of Casuals.

Mr. SHEPHERD asked the Minister of Health when the order for the medical inspection of casuals expired and whether it was his intention to extend it.—Mr. CHAMBERLAIN replied: I am extending the present direction on this subject, which expires at the end of this month, to the end of September next.

Welsh Board of Health.

Mr. JOHN WILLIAMS asked the Minister of Health whether he could make any statement to the House on the future constitution of the Welsh Board of Health; whether it was proposed permanently to reduce that body to three; and what the number of the body was when originally set up.—Mr. CHAMBERLAIN replied: The Welsh Board of Health consisted of three members when it was originally constituted. At a later date the administrative officer for public health became an ex-officio member of the board. With regard to the first and second parts of the question, I would refer the hon. Member to the answer given on June 25th.

Mr. JOHN asked the Minister of Health who was the present Member for Wales on the National Health Insurance Joint Committee; who would be the member in future; and whether Mr. John Rowland, a member of the Welsh Board of Health, was to act as deputy for him.—Mr. CHAMBERLAIN replied: The present member of the National Health Insurance Joint Committee appointed by me under Section 88 of the National Health Insurance Act, 1924, as "a person having special knowledge and experience of National Health insurance in Wales," is the hon. Member for Monmouth, and I do not propose to make any change. I have appointed Mr. John Rowland to succeed Sir Thomas Hughes as deputy to the hon. Member for Monmouth at meetings of the Committee at which the hon. Member is unable to be present.

Captain ARTHUR EVANS asked the Minister of Health if he would consider the advisability of appointing one of the present reduced Welsh Board of Health a member of the joint consultative committee of the United Kingdom, instead of appointing a deputy for a representative whose official connexion with the Welsh Board of Health has now terminated.—Mr. CHAMBERLAIN replied: My hon. friend appears to be under some misapprehension. The hon. Member for Monmouth, who is and has for some years been the Welsh representative on the National Health Insurance Joint Committee, is not in any way officially connected with the Welsh Board of Health. The retiring chairman of the Welsh Board of Health was appointed to act as deputy to the hon. Member for Monmouth at meetings of the Committee at which the hon. Member was unable to attend, and I have now appointed a member of the Welsh Board of Health to act in the same capacity.

Captain EVANS also asked the Minister of Health, seeing that the actual saving effected by not appointing one of the present reduced Welsh Board of Health as chairman was approximately £300 per annum, and that the status and influence of such an important board must be detrimentally affected by the exclusion of a chairman, whether he would appoint one of their present number chairman.—Mr. CHAMBERLAIN replied: The status and functions of the Welsh Board of Health are not, in my view, affected by the decision not to appoint a chairman. The bulk of the work of the board is satisfactorily done by the members of the board in their individual capacity, and meetings of the board are but rarely held. The answer to the last part of the question is in the negative.

Unclaimed Bodies for Anatomical Examination.

Mr. KELLY asked the Minister of Health the reason for the request made by his department that unclaimed bodies of deceased patients in the Park Prewet and Brookwood Asylums, and other mental institutions under the Farnham Union, should be handed over to the University of Oxford for anatomical examination.—Mr. CHAMBERLAIN replied: The request to which the hon. Member refers has been made to these and other similar institutions in order to assist in the provision, under proper safeguards, of unclaimed bodies for anatomical examination, which is indispensable to medical education.

MONDAY, JULY 2ND.

Biochemical Research.

Miss WILKINSON asked the President of the Board of Trade what aid, financial or otherwise, the Government was giving to promote research into the practical application to industry of the science of biochemistry.—Mr. H. G. WILLIAMS (Parliamentary Secretary to the Board of Trade) replied: A considerable amount of biochemical research is conducted by the Department of Scientific and Industrial Research, particularly in relation to its investigations on the preservation and transport of foodstuffs. The Department also makes grants to a number of coöperative research associations, organised by various industries to investigate their own special problems, whose work is partly of a biochemical nature. As this work is closely linked up with other work not directly biochemical in nature, it is impossible to estimate its cost separately.

Refuse Burning in Louth and Public Health.

Lieut.-Colonel HENEAGE asked the Minister of Health if he had received a resolution signed by inhabitants of Louth calling attention to the burning refuse pit in the town, which was so situated that odours and smoke were causing danger to health and annoyance to inhabitants; and what reply he had returned.—Sir KINGSLEY WOOD replied: My right hon. friend has received a petition in reference to this matter, and is communicating with the town council.

The Rating of Voluntary Hospitals.

Captain CAZALET asked the Minister of Health whether he was aware of the inconsistencies prevalent to-day throughout the country in regard to the rating of voluntary hospitals; that in Devon the rating assessment committees had resolved that voluntary hospitals in that county should be rated at 7*s.* 6*d.* per bed, including nurses' beds, while in Wiltshire the rating and assessment committees had adopted the basis of £5 per head additional to nurses' beds; and whether he could give to the House the assurance that such inequalities would be removed under the new Valuation and Rating Act.—Sir KINGSLEY WOOD replied: The Central Valuation Committee has reported the existence of considerable diversity of practice in the assessment of voluntary hospitals. My right hon. friend has circulated the Committee's recommendations on this matter to the local authorities concerned, but he is not empowered to interfere with their discretion in the assessment of any class of hereditament. I may add that the matter is not germane to the Government's proposals for giving relief from rating burdens to agriculture and industry.

Spitting in Public Places.

Major COLFOX asked the Minister of Health whether he would, in the interests of public health, introduce legislation to prohibit the practice of spitting in public places.—Sir W. JOYNSON-HICKS replied: No fresh legislation is required. The matter is one which can be dealt with by the local authorities by means of good rule by-laws under the Municipal Corporations Act and Local Government Act. By-laws on the subject are in force in a number of places.

Destruction of Lost or Strayed Dogs.

Sir ROBERT GOWER asked the Home Secretary whether his inspectors' reports showed that adequate accommodation existed at all police stations for the reception of lost and strayed dogs; and what methods were adopted by the police for the humane destruction of lost or strayed dogs which were not claimed by their owners.—Sir W. JOYNSON-HICKS replied: I have no information as to the arrangements outside London, but in the Metropolitan Police District the accommodation is adequate, and it is a condition required of the contractors that the dogs handed over to them which are not claimed should be destroyed in such manner as to cause as little pain as possible.

TUESDAY, JULY 3RD.

Medical Services in Scotland.

Sir ARCHIBALD SINCLAIR asked the Secretary of State for Scotland whether his attention had been drawn to the statement in the Report of the Scottish Board of Health that the gap was widening between the standard of medical services in the Highlands and that in the Lowlands; and what provision was being made for the maintenance and improvement of the Highlands and Islands medical service during the current year.—Sir J. GILMOUR replied: The statement referred to expresses the view of the Consultative Council on Highlands and Islands, whose report I have seen and am now considering. As regards the second part of the question, the money available in the Highlands and Islands (Medical Service) Fund is sufficient to maintain the medical services on their present scale during the current year. It is anticipated, however, that the fund will be exhausted by the middle of next financial year, before which time the question of what further financial provision should be made will be fully considered in the light of the whole circumstances of the case.

Sir A. SINCLAIR asked if provision would be made in the meantime for catching up the leeway as well as for maintaining these services at the lower level to which they had fallen.

Sir J. GILMOUR said that the provision for this year had been made and would be carried out to the full.

THE ASTHMA RESEARCH COUNCIL.—A part-time research scholarship is being founded to investigate the various physical treatments of asthma. The selected candidate will be required to visit Mont Dore and other continental resorts for the treatment of asthma prior to taking up the work in London, and preference will be given to one who already holds a professional post. An advertisement in this issue of THE LANCET sets out the conditions of the appointment. Dr. E. A. Cockayne and Colonel F. E. Fremantle, M.P., have joined the Medical Advisory Committee of the Council.

Medical News.

UNIVERSITY OF OXFORD.—At a Congregation held on June 28th the following degrees were conferred:—

D.M.—A. A. F. Peel and F. E. Fremantle.
B.M.—F. G. Parker.

Dr. John Farquhar Fulton has been elected to a research fellowship in natural science at Magdalen College. Dr. Fulton came to Magdalen as a Rhodes Scholar in 1921. He obtained a first class in the final honour school of physiology in 1923, and subsequently the degree of D.Phil. by research. He returned to Harvard, and since completing his courses for the D.M. degree of that University has been working in Dr. Harvey Cushing's clinic. He proposes to carry on research in physiology and to write on the history of physiology and the bibliography of the works of Robert Boyle.

UNIVERSITY OF BIRMINGHAM.—At recent examinations the following candidates were successful:—

M.D.

J. F. Brailsford and F. W. M. Lamb.

FINAL EXAMINATION FOR M.B., CH.B.

Second-class Honours.—G. H. Knight,* and A. B. Taylor.†
* Distinction in Medicine and Surgery.
† Distinction in Medicine and Midwifery.

Pass.—Mohamed Badr-El-Din, Charles Davies, I. K. Donovan, R. E. Johnson, C. E. Perry, F. R. Roberts,‡ M. C. Rosser, M. D. Sandoz, J. G. Stooke, and Nubar Yacoubian.
‡ Distinction in Midwifery and Diseases of Women.

FINAL EXAMINATION FOR B.D.S.

Class I.—A. T. Wynne.

FINAL EXAMINATION FOR DIPLOMA IN DENTAL SURGERY.

F. W. Hanlan, W. F. Hinds, and E. E. Newitt.

UNIVERSITY OF DURHAM.—At Convocations on June 26th and 27th the following degrees, diplomas, and licences were conferred:—

M.D.—Katherine M. Cellan-Jones, Margaret B. Herbst, I. M. McLachlan, T. H. Meek, P. J. O'Connell, L. G. Pearson, C. E. Reindorf, L. F. Richmond, T. W. Shaw, F. E. Stabler, and M. M. Suzman.
M.D. (for Practitioners of 15 Years' Standing).—Harold Balme.
M.S.—W. P. T. Watts.
M.B., B.S.—H. M. Brown, D. S. Buchanan, W. C. E. Diamond, M. A. Gaffar, Coley Goldstein, J. C. V. Hindhaugh, C. F. Ind, S. W. Smith, J. M. Tait, and H. G. Ungley.
B.S.—Ibrahim Girgis and L. G. Pearson.
B.Hy. and D.P.H.—T. L. J. Coxon, E. F. D. Dawson-Walker, and J. W. Hunter.
L.D.S.—Margaret I. Lamb, R. R. Maclean, C. E. Shafto, and G. S. Yeoman.

UNIVERSITY OF SHEFFIELD.—At recent examinations the following candidates were successful:—

M.B., Ch.B.—K. J. G. Milne,* G. B. Thomas,* W. Alcock, R. D. Dewar, T. E. Gumpert, T. K. Owen, W. A. Timperley, and Joan J. J. Wallace.
* With second-class honours.

UNIVERSITY OF GLASGOW.—At a graduation ceremony on June 29th the following degrees were conferred:—

M.D.—*Mary P. McCunn, Robert Armstrong, and David Henderson.
* With commendation.

The History of Medicine Prize was awarded to Dr. William James Rutherfurd for an essay entitled A Cock to Æsculapius.

UNIVERSITY OF ST. ANDREWS.—At a graduation ceremony on June 28th the honorary degree of LL.D. was conferred, among others, upon Dr. E. P. Cathcart, Gardiner Professor of Physiological Chemistry in the University of Glasgow; and Dr. William Darrach, Professor of Surgery in Columbia University, New York.

UNIVERSITY OF DUBLIN.—At a meeting of the Senate on June 30th the honorary degree of Master of Surgery was conferred on Sir John Bland-Sutton; the honorary degree of Doctor of Science on Dr. George Linius Streeter, director of the Department of Embryology in the Carnegie Institute, Baltimore, U.S.A.; and the honorary degree of Master of Arts on Miss Margaret Huxley, an Overseer of Trained Nurses in Ireland. Of Sir John Bland-Sutton, the Public Orator, Sir Robert Tate, spoke as famous alike as operative surgeon, teacher, scientific investigator, and learned archæologist. Miss Huxley, generally regarded as the leading representative of nursing in Ireland, the Public Orator described as "feminam strenuam, certam, optimam" in reference to her magnificent work as matron of Sir Patrick Dun's Hospital. In the evening Miss Huxley was entertained at dinner by a large company of hospital matrons.

HUNTERIAN SOCIETY.—Dr. Arthur Westerman has been elected president of this Society for the coming year. The honorary secretaries are Mr. W. E. Tanner and Dr. D. C. Norris.

EPSOM COLLEGE: ANNUAL GENERAL MEETING OF GOVERNORS.—Dr. Raymond Crawfurd presided at the seventy-fifth annual general meeting of the Governors of Epsom College on Friday, June 29th, 1928, at the office, 49, Bedford-square, W.C., when there was a good attendance. The following is a list of the successful candidates for pension and foundation scholarships at the elections, together with the number of votes gained in each case. Dr. Raymond Crawfurd, Dr. J. Walter Carr, and Dr. Seymour Taylor were the scrutineers. Hadlow Pensioners: Dr. James S. Robertson, 4157; Mrs. Gertrude Middlemist, 3326; Mrs. Elizabeth Christian, 2485; and Mrs. Mary G. S. Kenny, 2086. Ordinary Pensioners: Mrs. Ellen M. Blake, 2057; Dr. Lambert Houghton, 2012; Mrs. Ida M. S. Style, 1672; and Dr. Vincent O. Taylor, 1634. Pugh Pensioner: Mrs. Mary K. Ingledew, 1481. Brodie Sewell Annuities: Miss Ella M. Leney, 2031; and Miss Elizabeth E. B. D'Olier, 1793. Foundation Scholars: Alfred G. Stansfeld, 17,657; Geoffrey G. Wallis, 13,079; John R. Copeland, 11,042; John A. K. Holburn, 10,757; John Watson, 10,496; Antony L. Haynes, 10,427; Louis C. Dillon, 8051; and Eric J. Holborow, 6531.

Dr. F. W. Collinson and Dr. R. W. Innes Smith were elected vice-presidents of the College in recognition of their valued services, each having collected a sum of over £1000 as honorary local secretary.

In proposing the adoption of the report for the past year, the Chairman referred to the progress of the fund opened for the provision of a new sanatorium, outline plans for which, together with full particulars as to the accommodation, were given in THE LANCET of Dec. 3rd last. Dr. Crawfurd pointed out that if two sums of £5000 were to be received, the Council would be in a position to put the work in hand, as the total collected to date amounted to close upon £5000. The College would benefit in another direction by the provision of this building, as the old sanatorium could be easily adapted for the admission of about 40 more boarders, and the enlargement of the school in this way would result in many economies. Furthermore, the increased income would enable the Council to improve the salaries paid to the masters.

BRITISH PATHOLOGISTS ASSOCIATION.—The second summer meeting of this association was held in the Pathological Department of the Royal Infirmary, Chester, on Saturday, June 30th, Dr. W. H. Grace, pathologist to the hospital, being in the chair. The meeting was devoted to the discussion of the methods used in the examination of the blood. Procedures were described and demonstrated as follows: by Dr. J. G. Greenfield, the making and staining of blood-films, the differential count of the white cells, the counting of the red and white cells, the estimation of hæmoglobin by the Hellige method, and the reticulocyte count; by Dr. A. Renshaw, the examination of the blood for parasites and the presence of organisms; by Dr. S. C. Dyke, the platelet count, the grouping and matching of bloods, and the estimation in the blood of cholesterol, bilirubin, and inorganic phosphates; by Dr. Grace, the estimation of the blood-sugar by the Folin-Wu method; by Dr. A. G. Shera, the estimation of the blood-sugar by MacLean's method and of the blood-urea by Kennaway's method; by Dr. A. F. S. Sladden, the estimation of the blood-urea by a modification of MacLean's method; and by Dr. W. E. Carnegie Dickson, the estimation of the serum calcium. The members of the staff of the Chester Royal Infirmary entertained the members of the association at dinner in the evening.

LONDON HOSPITAL PRIZE-GIVING.—The distribution of prizes on June 29th opened with a report on the Medical College by the Dean, Prof. William Wright. After referring to the knighthoods recently conferred on two old London Hospital men, Dr. J. A. Hosker, of Bournemouth, and Mr. H. S. Newland, of Adelaide, he mentioned that Sir Henry Head had been awarded the Moxon Medal of the Royal Society, and that Prof. Major Greenwood had been elected F.R.S. The hospital had lost, by resignation, the services of Dr. Lewis Smith and Sir Hugh Rigby, whose professional lives had been uninterruptedly linked with it. The vacancies thus left in the hospital staff had been filled by Dr. Russell Brain and Mr. Hugh Cairns, whilst Mr. G. V. Stephenson had been appointed demonstrator of anatomy in the College. Prof. Wright then spoke of the deaths which had occurred during the year, including those of Dr. C. W. Daniels, Mr. A. D. Dinnis, Dr. Nelson Younger, Mr. L. R. Fifield, and Dr. A. Lister. Another loss was sustained by the death of Mr. W. Douro Hoare, chairman of the College Board from 1898 to 1921, to whom the College owed much. A lectureship

in ophthalmology, said Prof. Wright in conclusion, had been established with a legacy of £1000 from Mr. Warren Tay.

The Chairman, Lieut.-Colonel W. M. Pryor, then introduced Sir Samuel Hoare, Secretary of State for Air, who came, he said, as the head of a family which had been intimately associated with the hospital and College for many years.—Sir Samuel presented the prizes and honorary certificates of merit awarded to students of the Medical College and Dental School. As the world grew more complicated, he said, it was more and more difficult for men in one profession to keep in touch with men in another. He came, therefore, to learn something about the London Hospital and to tell something about the development of aviation, and he was glad to think that there was already a link between the two in the person of Group-Captain Martin Flack, one of his senior medical advisers. The tests of fitness for flying had been developed by practice rather than theory. The investigators had started by taking their hundred best pilots and analysing their qualities. He wondered whether this method could be applied in the medical profession or in politics. In the profession of collecting money it would be unnecessary to look out for 100 beggars; they could simply analyse the qualities of Lord Knutsford. The medical profession, continued Sir Samuel, was trying to raise the standard of the world's health. He was engaged in attempts to improve its communications. These were the two first needs of the world to-day, especially in the less-developed parts of the British Empire. In recent military operations in the Kurdistan mountains there was a very serious outbreak of dysentery among the troops, but it proved possible, with aeroplanes, to remove the 200 sick to Bagdad, so that they all recovered.

A vote of thanks to Sir Samuel Hoare was proposed by Lord Knutsford, and seconded by Dr. Robert Hutchison.

CARLISLE FEVER HOSPITAL.—As the result of the recent inquiry, described in THE LANCET of June 16th (p. 1239), the Charity Commissioners have agreed to the transference of the Carlisle Fever Hospital to the corporation of the city. The claim of the city council to the control of the hospital was based upon the fact that, in conjunction with the rural district council, it had for many years past chiefly maintained the institution. The claim was opposed by the governing body of the Cumberland Infirmary, which is only 150 yards from the fever hospital, on the grounds that, in the event of further extension becoming necessary, the site of the fever hospital would provide the means of enlargement and that an institution for the treatment of cases of infectious disease is in its wrong place amid a considerable population.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, July 9th, to SATURDAY, July 14th.—ST. JOHN'S HOSPITAL, In-patient Department, 262, Uxbridge-road, W. Special demonstration at 2.30 P.M. on Tues.—ALL SAINTS' HOSPITAL, Vauxhall Bridge-road, S.W. Special demonstration at 2.30 P.M. on Wed.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Broad-street, W.C. Special demonstration at 3 P.M. on Thurs. The above are free.—ST. MARK'S HOSPITAL, City-road, E.C. —One week's special course in proctology. Operations, demonstrations, and lectures.—PRINCE OF WALES'S HOSPITAL, Tottenham, N. Two weeks' special course in medicine, surgery, and the allied specialties. Further particulars from the Secretary.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham.

MONDAY, July 9th.—2.30 to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Throat, Nose and Ear Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, and Ear, Nose and Throat Clinics. Operations.
FRIDAY.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham.

THURSDAY, July 12th.—4 P.M., Dr. Hector C. Cameron: Demonstration of Children's Ailments.

Appointments.

BRICKWELL, F., M.B. Lond., M.R.C.S., has been appointed Medical Officer, Slough and Stoke Poges Districts.

CONNAN, D. M., M.B., B.S. Lond., D.P.H., Medical Officer of Health for Bermondsey.

Manchester Royal Infirmary: TAYLOR, B. A., L.R.C.P. Lond., M.R.C.S., House Surgeon to the Special Departments; NUGENT, Miss E. A., L.R.C.P. Lond., M.R.C.S., Junior Assistant House Surgeon (Central Branch); SOMERFORD, A. R., M.B., Ch.B. Manch., Assistant Medical Officer, Out-Patient Department; STOKOE, Miss L., M.B., Ch.B. Manch., Clinical Assistant, Medical Out-Patient Department; ANDERSON, Miss J., L.R.C.P. Lond., M.R.C.S., Clinical Assistant, Surgical Out-Patient Department; PEACH, Mrs. E. M., M.D. Manch., Assistant Medical Officer, Dermatological Department; SCOTSON, F. H., F.R.C.S. Eng., reappointed Resident Surgical Officer; GRAY, E. D., M.A., M.B., Ch.B. Aberd., reappointed Junior Assistant Medical Officer, Radiological Department; SMIRK, F. H., M.D. Manch., reappointed Medical Registrar; LAMBERT, V. F., F.R.C.S. Edin., Assistant Surgical Officer, Aural Department.

Queen Charlotte's Maternity Hospital: LOWRY, H. C., M.B., B.Ch., B.A.O. Belf., F.R.C.S. Edin., Senior Resident Medical Officer; and HEGGS, G. B. M., M.R.C.S., L.R.C.P. Lond., Assistant Resident Medical Officer.

Salford Royal Hospital: APPLETON, F., M.B., Ch.B. Manch., House Surgeon attached to the Orthopædic Department; BOLAND, C. R., M.B., Ch.B., B.A.O., attached to the Genito-Urinary Department; and COCHRANE, H. L., M.B., Ch.B., attached to the Special Departments.

Certifying Surgeons under the Factory and Workshop Acts: JORDAN, G. R. L., M.B., B.Ch. Dub. (Halstead, Essex); and WILLIAMS, J. W., L.R.C.P. Lond., M.R.C.S., L.M.S.S.A. (Penarth, Glam.).

Vacancies.

For further information refer to the advertisement columns.

Association of Surgeons of Gt. Britain and Ireland, 17, Wimpole-street, W.—Surgical Scholarship. £350.

Asthma Research Council, London Clinic, Ranelagh-road, S.W.—Half-time Research Scholar. £300.

Barnsley, Beckett Hospital and Dispensary.—H.P. £140.

Bath, Royal United Hospital.—Asst. H.S. £100.

Birkenhead General Hospital.—Cas. H.S. £100.

Birmingham, Queen's Hospital.—Med. Reg. Also 3 Res. Surg. Officers. £200 and £100 respectively.

Brighton, Royal Sussex County Hospital.—Hon. Dermatological Clinical Asst.

Bury Infirmary.—Third H.S. At rate of £150.

Cambridge, Addenbrooke's Hospital.—Resident Anæs. At the rate of £180.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Jun. H.S. £50. Also Pathologist. £75.

Chichester, Graylingwell Mental Hospital.—Third Asst. M.O. £350.

Coventry, Coventry and Warwickshire Hospital.—Res. H.P. £125.

Eastcote, Middlesex, St. Vincent's Orthopædic Hospital.—Res. M.O. At rate of £150.

East London Hospital for Children, &c., Shadwell, E.—Res. M.O. £200.

Exeter, Royal Devon and Exeter Hospital.—Hon. Asst. P.

Exminster, Devon Mental Hospital.—Jun. Asst. M.O. £300.

Gordon Hospital for Rectal Diseases, Vauxhall Bridge-road, S.W.—Res. H.S. £75.

Harefield, Middx., County Tuberculosis Sanatorium.—Sen. Asst. Res. M.O. £450.

Herefordshire General Hospital.—H.P. At rate of £100.

Hospital for Consumption and Diseases of Chest, Brompton.—H.P. £50.

Kimberley Hospital, South Africa.—Radiologist-Jun. H.S. £750.

Lahore, Mayo Hospital.—Anæsthetist. Rs.500/-25-1000/- per mensem.

Leeds City Hospitals.—Med. Supt. £850.

Leeds Public Dispensary.—Sen. Res. M.O. £200. Also Hon. P.

London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150.

London Jewish Hospital, Stepney Green, E.—Hon. Radiologist.

Maidstone, Kent County Ophthalmic and Aural Hospital.—Aural H.S. At rate of £200.

Manchester, St. Mary's Hospitals.—4 H.S.'s. Each at rate of £50.

Manchester, Salford Royal Hospital.—H.P. At rate of £125.

Marseilles, Queen Alexandra Memorial Hospital.—Res. M.O. At rate of £150.

Mental Hospital, Berrywood.—Locum tenens M.O. £7 7s. per week.

Miller General Hospital for South-East London, Greenwich-road, S.E.—H.S. £125.

National Hospital, Queen-square, W.C.—Hon. Surg. Asst.

Newark Hospital and Dispensary.—Res. H.S. At rate of £150.

Nottingham, City Mental Hospital.—Jun. Asst. M.O. £350.

Nottingham General Hospital.—Res. Cas. O. At rate of £200.

Nottinghamshire County Council and Mansfield Woodhouse Urban District Council.—Joint M.O. £700.

Portsmouth, Royal Portsmouth Hospital.—Sen. H.S., also Cas. O. At rate of £200 and £100 respectively.

Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Royal Army Medical Corps.—Commissions.

Royal College of Surgeons of England.—Election to Court of Examiner, also Election of Examiner in Dental Surgery.

Royal Manchester Children's Hospital, Pendlebury, nr. Manchester. Res. M.O. At rate of £125.

Ryde, Royal Isle of Wight County Hospital.—Res. H.S. £130.

St. Leonards-on-Sea, Buchanan Hospital.—H.S. £150.

St. Mark's Hospital for Cancer, &c., City-road, E.C.—Res. Surg. O. At rate of £150.

St. Mary's Hospital Institute of Pathology and Research, Paddington, W.—Research Studentship. At rate of £200.

St. Mary's Hospital, W.—Dental Surgeon.

St. Pancras School for Mothers, Ampthill-square, N.W.—M.O. 1½ gns. per consultation.

Sheffield, Crimicar Lane Sanatorium.—Asst. Tuberculosis Officer. £450.

Stoke-on-Trent, Longton Hospital.—H.S. £120.

Taunton, Taunton and Somerset Hospital.—Sen. and Jun. House M.O.'s. At rate of £150 and £100 respectively.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. Both at rate of £100.

Wallasey, Victoria Central Hospital.—Jun. H.S. At rate of £100.

West Kent Joint Hospital Board (Infectious Hospitals).—R.M.O. £400 per annum.

West London Hospital, Hammersmith-road, W.—Res. Asst. Surg. £200.

Westminster Hospital Medical School, S.W.—Hon. Lecturer on Tropical Diseases.

Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £100.

Births, Marriages, and Deaths.

BIRTHS.

BISHOP.—On June 28th, at Perryn-road, Acton, W., the wife of Dr. P. F. Bishop, of a son.

CADE.—On June 28th, at Harley-street, W., the wife of Stanford Cade, F.R.C.S., of a daughter.

DONALD.—On June 25th, at a nursing home, Kensington, the wife of Charles Donald, F.R.C.S., of a son.

HUTCHINSON.—On June 29th, at Edwardes-terrace, Kensington, W., the wife of Samuel Hutchinson, M.R.C.S., of a daughter.

MOORE.—On June 28th, the wife of David L. H. Moore, M.B., of a daughter.

STANLEY.—On June 23rd, at rue des Belles Feuilles, Paris, the wife of E. Gerald Stanley, M.D., M.S., F.R.C.S., of a daughter.

MARRIAGES.

EDWARDS—SIMCOCK.—On June 27th, at St. Paul's Church, Heaton Moor, Manchester, Norman L. Edwards, M.B., F.R.C.S., to Margaret Simcock, M.B., eldest daughter of Dr. and Mrs. James Simcock, of Heaton Moor.

STEELE—THOMPSON.—On June 28th, at All Saints', Foots Cray, Kent, Tom Barton Steele, L.D.S. R.C.S. Eng., of Thorneycroft, Christchurch-road, Bournemouth, to Christine Lucy Winifred, only daughter of the late Richard Hanan Thompson, of Fairlight, Chislehurst, and the late Mrs. Thompson, of Upmeads, Dunbar-road, Bournemouth.

DEATHS.

CHETWOOD.—On June 28th, at Christopher-street, E.C., William Chetwood, M.R.C.S., L.R.C.P., aged 82 years.

CROOKSHANK.—On July 1st, suddenly, at Ridge Hill Manor, East Grinstead, Edgar March Crookshank, J.P., M.B., in his 70th year.

HEPWORTH.—On May 20th, at Camberwell, Victoria, Australia, Archibald Francklin Hepworth, L.R.C.P. & S. Edin., aged 61.

READE.—On June 30th, in London, Lt.-Col. William Lloyd Reade, R.A.M.C., aged 70 years.

THISTLE.—On June 26th, at Torquay, Frederick Thomas Thistle, M.D.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

HELPERS IN HYGIENE.*

BY ANDREW BALFOUR, C.B., C.M.G., M.D. EDIN.,
DIRECTOR, LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

THE remarkable changes which the last 25 years have witnessed would have heartened one keen helper in hygiene, the late Sir Benjamin Ward Richardson, a Victorian pioneer and somewhat of a seer in his day. He was the author of a notable book entitled "The Health of Nations," which all those interested in the history of hygienic endeavour should study but, for my present purpose, I would rather cite a passage in his "Vita Medica," that autobiography which he completed in 1896, two hours before he was seized with fatal illness. He has therein a chapter entitled "Efforts towards the Extinction of Disease," where he says: "The best idea, therefore, is that the disturbance or catastrophe called disease—excluding accidents—is not simply to be met by treatment, although that may be necessary and beneficial, but is to be prevented, and that with so much perfection that it shall altogether become extinct, or remain as a mere historical ghost."

Another prophet, though possibly a somewhat optimistic one, who happily is still with us, was the distinguished zoologist, Sir Ray Lankester, when he wrote, a good many years ago, that if we could only apply our present knowledge properly all communicable disease could be stamped out in the short course of 50 years.

Now neither of these men, shrewd, scientific, and well-informed, would have ventured to make such statements unless he had good reason for believing them to be true. They *had* good reason for, within the life-time of each, a veritable revolution had been wrought in our knowledge of the causes and spread of those diseases which can be transmitted from man to man or from some lower animal to man, with or without the aid of an intermediary, in other words, indirectly or directly.

Early Helpers.

It is sometimes forgotten, however, that long before Pasteur revealed the world of microbes and Manson showed how insects play a part in the spread of disease, many helpers in hygiene, by careful observation and sound reasoning, had reached conclusions which, when they translated them into action, yielded very gratifying results. True these men worked in the dark, but they did get hold of some essential facts and so, long before anything was known about the rôle of lice in typhus fever, Lind, the great naval surgeon of the eighteenth century, indicated clearly and correctly what measures would prove effective against that complaint. Similarly, other observers noted the connexion between dirt and diseases of various kinds, notably such intestinal disorders as diarrhœa and dysentery, and preached and practised a hygiene of environment. Long ago in Scotland there was a proverb, "the clartier (that is, the dirtier), the cosier," but the slogan of the health reformers was very rightly "the dirtier, the deadlier." and the deadlier, remember, not only to yourself and your family but to your neighbours and fellow citizens. These early reformers were very largely like voices crying in the wilderness. Few heeded them, save in communities like the Army and Navy where, if the officers commanding were believers, disciplinary measures could be taken, or where pressure could be brought to bear on local authorities and the Government, as when John Howard, shocked and horrified by the condition of the prisons, raised his voice and testified against them.

Mead and Howard, Percival, Ferrier and Currie, the civilians, Lind, Trotter and Blane, the naval surgeons, Pringle, Monro and Jackson, the Army hygienists, lived, laboured, and accomplished much good in a limited way. The country doctor, Jenner, by introducing vaccination, conferred upon suffering humanity one of the greatest boons ever vouchsafed to it and radically altered the situation with respect to small-pox and its victims. It was not, however, until Chadwick, the lawyer, came upon the scene and, with fearless enthusiasm, dogged determination and no little pugnacity, took up the cudgels on behalf of health, that any real and widespread progress was made, apart from what the good Lord Shaftesbury accomplished in the way of factory reform. Then and thereafter, however, a marvellous change ensued, mainly as a result of an organised campaign for cleanliness. What a fight it was,

* An address delivered under the auspices of the Isle of Man Red Cross Society at the conclusion of Health Week, March 4th, 1928. (Abridged.)

against superstitions and vested interests and supineness and bitter opposition! Although it is true that reform was in the air, that it was a period of quickening and advance in several directions, perhaps the battle might never have been successful had not the country been visited periodically by outbreaks of cholera which swept away hundreds. The scared populace was thankful to listen to those who brought a message of hope, more especially when Dr. John Snow showed that cholera was spread by the intestinal discharges of the sick and indicated polluted water as a source of infection. It was, in great measure, fear which made the people of England loosen their purse strings and provide the wherewithal to obtain pure water, clean dwellings, an efficient removal and disposal of filth and refuse, but, to do these Victorians justice, once they realised they were getting value for their money, they gladly bore the burden and so reaped the reward.

There were, however, other directions in which these early helpers of hygiene exhibited activity. The health of the individual was not altogether neglected though it is true that, for the most part, the individual received attention chiefly because he formed part of a community. It was, in other words, communal, rather than personal hygiene to which the earlier workers devoted themselves. Take, for example, Lind's efforts to get scurvy stamped out of the Navy by the issue to the individual sailor of a ration of lemon juice. Consider how the individual slave benefited from certain efforts affecting his personal welfare, made by Wilberforce and others in their campaign against the appalling conditions of the trade in black ivory.

Until quite recently I fancy that few had any idea that some of the recent developments on which we pride ourselves had their counterparts long ago. Dr. Mabel Buer, of Reading University, has unearthed some interesting facts which show that considerable attention was paid to infant and child welfare in the latter part of the eighteenth and the beginning of the nineteenth century. There was actually a baby clinic in London in 1815, the year of Waterloo.

Now, whence came these more enlightened ideas on the saving of young lives? From a study of the ancient Greeks, that nation of heroes, athletes, and philosophers who certainly were well versed in all matters relating to bodily health? It is unlikely. From the ancient Romans, that race which performed remarkable feats in sanitary engineering and had inherited some of the hygienic wisdom of the Greeks? It is improbable, for the Romans appear to have had little thought for child life.

John Peter Frank.

I cannot help wondering if it was not a legacy from a very remarkable man, a great helper in hygiene, and indeed not only a helper but a leader. So far as I can discover, his name and fame have in this country been wholly forgotten, though upon the Continent, where he lived and worked, they are remembered and they are known also to certain American hygienists. Perhaps in England there has been too great a tendency in matters hygienic to say we are, or were, the people and wisdom remains with us. In other words, knowing that England led the way in public health legislation, English students of the subject are a little apt to imagine that modern hygiene originated in this country and are not disposed to look abroad and see what other nations had done in pre-Chadwickian days. It is true that the English, first of all peoples, placed hygiene on a sound basis, established a definite system of organised sanitary control and enlisted the power of the law in regulating and enforcing public health procedure. Let us, however, remember that when England was sunk in dirt and squalor the cleanliness of the Dutch was proverbial: and let us pay homage to the memory of that leader of whom I spoke, who was no other than John Peter Frank.

His name will not be found in the Encyclopædia Britannica, though quite a respectable space is devoted to another Frank, one Jakob who, of all things on earth, was a Jewish theologian. Yet our Frank was once a name with which to conjure and Napoleon, no mean hygienist himself, tried in vain to obtain his services. He was born at Rotalben, in Bavaria, in 1745, the year before Culloden, when the death-rate in London was 50 per 1000—in 1926 it was 11·6—and life had an uncertainty about it to which it is now a stranger save in the matter of motor vehicles. His father was French. After studying at Heidelberg, Metz, and Strassburg, he gravitated to Göttingen and then to Pavia, eventually becoming Director-General for Sanitation in Lombardy somewhere about 1786. Think of that! In 1795 he was called to Vienna by the Emperor of Austria as consultant for the health of the troops. Thereafter we find him as a Professor at Vilna, then at St. Peterburg, and finally back again in Vienna, where he died, full of years and honours, in 1821.

He must have been a man of courage and humour. When he lay dying there were eight eminent doctors round his bed who had been summoned to attend him. He smiled and said: "This reminds me of the end of a French soldier wounded by eight musket shots at the battle of Wagram." "Morbleu!" said he, dying, "it takes not less than eight bullets to kill a French grenadier."

Frank was a voluminous writer and covered a wide field, but I mention him here because as a hygienist he was far ahead of his period and because he wrote a truly astonishing book entitled "System einer vollstandigen Medicinischen Polizey," This, the first authoritative work dealing with public hygiene, appeared in successive volumes between the years 1779 and 1817.

It dealt with nearly every aspect of hygienic activity, including what we are pleased to regard as modern developments. The author writes on sexual hygiene and maternity and child welfare. He discourses on the education of children. He considers the value of foundling institutes and orphanages, and looks at schools and gymnasia from the public health standpoint. A volume is devoted to the problems of nutrition; food and drink being considered and the importance of moderation stressed. Housing is discussed and public health conditions generally. The question of cemeteries is not forgotten, and there are disquisitions on the healing art and on schools of medicine. The importance of veterinary knowledge and its relations to medicine receive attention, and altogether it is startling to find how Frank anticipated posterity. I can find no record of his great work being translated into English or even into French, but a treatise which he wrote on the method of rearing healthy children was translated into the latter tongue and hence it is conceivable that it was *his* influence which led to the early movements in infant welfare of which we have spoken. In addition to being a great clinician, a man of affairs and an illustrious hygienist, Frank was a dreamer of dreams. He formed the conception of a State guided by public health considerations, a kind of Utopia wherein Hygeia should reign supreme, and where affairs would be conducted for the true and lasting benefit of mankind. It is not surprising that, with his knowledge and acumen, he should have conceived such an idea when, all around him, he saw the misery and wretchedness produced by successive wars and reflected on the welter of intrigue and politics as well as on the endeavours of the proletariat to obtain a place in the sun. Remember, he lived through the days of the French Revolution when, with much that was vile and repellent, there were the germs of great things and indeed in some ways the beginnings of a new world.

Reforms in England.

Whatever may have been Frank's influence on England, there can be no doubt he left his mark on the State medicine of Germany, Scandinavia, and Russia, but he lived, for the most part, in troublous times, and even after his death the Continental nations had not the means to put his precepts generally into practice. The man who followed him was Max von Pettenkofer, but we need not consider his exploits as a helper in hygiene. Rather let us skip the intervening years, including those when Sir John Simon as Dr. Simon and central medical officer to the General Board of Health, was making history, ably assisted by Southwood Smith and others, albeit remembering that Lecky has penned a noble epitaph for these stirring and fruitful times. He wrote: "The great work of sanitary reforms has been, perhaps, the noblest legislative achievement of our age, and if, measured by the suffering it has diminished, has probably done far more for the real happiness of mankind than all the many questions that make and unmake ministries." Its history is set forth in Simon's classic "English Sanitary Institutions." The fight was won but the position had to be maintained; and, furthermore, it soon became evident that the victory, though great, was not complete. In addition it came gradually to be recognised, as Frank had long before envisaged, that new methods of warfare had to be adopted. Let us dwell on these matters for a space. To maintain the position an adequate health organisation was required; and that is why England and Wales have now a Health Ministry, advised by a chief medical officer. Its medical department has separate sections dealing respectively with general health and epidemiology; maternity and child welfare, in which section very fittingly a woman is senior medical officer and the medical officers and inspectors are all women; tuberculosis and venereal disease; the supervision of food-supplies; general practitioner services; sanitary administration in relation to infectious diseases; and Welsh Board of Health to deal with the public health interests of the Principality.

The Work of Public Authorities.

I will comment on some of these immediately. Meanwhile, let us continue the tale and note that other central departments of Government have important health interests and so are helpers in hygiene. The Board of Education with all its responsibilities for the health of school-children and the sanitary condition of schools, the Home Office with

its control of the health conditions in factories, mines, and workshops are appropriate examples.

The duties of the medical department of the Health Ministry are, speaking broadly, advisory and supervisory and cover a wide range which you will find listed in that masterly memorandum written by Sir George Newman and entitled "An Outline of the Practice of Preventive Medicine." Every community intent on hygienic progress and, more especially, every backward community striving to amend its ways, should be familiar with its pages. Perhaps the type of the Ministry's activities which will appeal most strongly to an audience of this kind is that whereby an expert is sent from the Ministry to assist the local health officer of a district where either some obscure infectious disease has made its appearance or where some communicable disorder is prevailing as an epidemic and has not yielded to ordinary measures. Medical officers of health greatly appreciate such skilled help, which is also naturally of very definite benefit to the local community and sometimes to the country as a whole. The official local helpers in hygiene are the councils of the areas into which the country is divided. These are the county councils. There is, as you know, a County of London and that county, small in area but packed with people, has its Council, and the Council has its medical and health organisation, a large and most important department charged with most onerous duties.

Outside London the work of the county councils is reinforced by that of the local sanitary authorities, be they urban, rural, or port. There are three types of urban local authorities—namely, the county boroughs, the municipal boroughs, and the urban districts—all acting through their respective councils. The county boroughs are represented by big towns, each with more than 50,000 people; the municipal boroughs are, as a rule, smaller towns; the urban districts, as the name implies, are also townships, and may indeed be very large and important places which happen never to have had conferred upon them by Parliament the title of county boroughs. As a type take Gosport, with its 33,000 people. The rural authorities are the councils of rural districts, which vary a good deal but which all answer to the description of country districts with comparatively small and scattered populations. In these districts, however, there may be small towns or clusters of villages. The state of matters as regards ports varies in different places and may be distinctly specialised. Great ports like London and Liverpool, for example, are under different guidance and control in health matters to the cities whose names they bear.

The Rank and File.

Now the councils of the above-mentioned boroughs and districts are concerned with various aspects of local government—not only with health work—and so, as a rule, at least in places of any size, the care of the people's health is entrusted to a public health committee. Such committees consist for the most part of laymen, and hence must have executive and advisory officers who are experts. These experts are the medical officers of health and in all important places, and I think I may say in all progressive and thoroughly up-to-date places, the medical officers of health are full-time officials. Here, in the great towns, the lesser towns, the villages, the countryside, we find what Newman calls the fighting-line of the never-ending, though usually unobstrusive campaign against inefficiency, disease and death. The medical officers of health and those who assist them and work with them, the sanitary inspectors, health visitors, and nurses, are, like Uriah the Hittite, in the forefront of the battle. So, too, are the executive officers of port health authorities. It is these men and women who are actually up against the forces of death, and remember that under the banner of the arch-destroyer there marches a multitude of legionaries, communicable and non-communicable diseases, ignorance, poverty, vice, drink, gluttony, greed, spite, selfishness, and so forth; it is these workers, the majority, capable and devoted, who are the greatest helpers in hygiene. They are the greatest in the sense that the private soldier, to whom Lord Haig paid tribute, is the greatest fighter. But for their numbers, skill, energy, patience, staunchness and devotion to duty, there would be another tale to tell from that which is told in the columns and obituary notices of the newspapers, in the medical press, and in the reports of the Health Ministry and of the Registrar-General. The commander-in-chief and his staff may plan a campaign. They cannot win it save through the deeds of the rank and file.

What are these deeds in the health campaign? It would take a long time to enumerate them in full, but from what has already been said you have no doubt gathered, if you knew it not previously, that they fall into two chief groups which we may conveniently term environmental and personal. The former are those which the pioneers in this country chiefly practised when they fought and won under the war cry—"Sanitas, sanitatis, omnia sanitas"; the latter embrace the principles which the far-sighted genius of Frank perceived to be essential and others which he did not visualise but which have established themselves throughout the fruitful years when the public health pendulum swung from the old order of things to the new.

The Menace of Dirt.

And here let me remark that, although it cannot be said to have swung too far, for the hygiene of the individual is of paramount importance, yet interest in the new has, I fear, led to some neglect of the old. How otherwise can one explain the filthy condition of some of our streets and highways, the shocking manner in which much of our food is handled, the refuse dumps one encounters in rural areas, foul blots upon fair scenes? It is true protests are raised but the faults continue, while one can imagine that in earlier days, say about 1860, the fervour of the reformers would have swept them away. Let us strive to preserve a balance and, in pursuit of new triumphs, not permit that insidious enemy, dirt, to regain positions from which he has been ousted. Even when dirt does not spell disease it leads to a lowering of tone, to a lack of self-respect, to a slackening of fibre. The trouble is partly due to the fact that much of the sanitation which formerly very closely concerned the medical officer of health has been relegated to other control. In the earlier days he had to fight like the devil, or shall we say like a good angel, to secure pure and sufficient water supplies, to get sewerage systems established, to ensure the healthiness of dwellings. Nowadays, for order has long since succeeded chaos, water supplies, sewerage and sewage works, house drainage and so forth are in the hands of competent engineers. Minor engineering and house sanitation are looked after by well-trained and certificated sanitary inspectors. Good and well, but from what I hear and what I see, I believe it would be an advantage if our medical officers of health had a little more time to keep in personal touch with these matters. This, I believe, is even more true in the case of the removal of nuisances and of refuse, one of the chief environmental duties in the olden days and still in tropical countries a most essential part of the health officer's routine.

As of yore the other environmental deeds comprise action relating to housing and town-planning, smoke prevention, the inspection of food, the control of infectious diseases, and inquiries into offensive trades. I cannot list them all but, with the exception of the control of infectious diseases, they have slipped a little into the background, for a multitude of activities relating to the hygiene of the individual now falls to the lot of the medical officer of health and certain of his assistants. In the matter of practical application these new duties are a product of this century and comprise maternity and child welfare work, the special and intensive control of tuberculosis, and the venereal diseases from the standpoint of the infected individual, the care of the health of the school child, the care of the blind, and occasional duties arising out of the National Health Insurance Act.

Formerly the great idea was to stamp out disease, especially communicable disease. That great idea persists, but along with it there is now the conception of rearing a sound and healthy race from the start, of extending the campaign to diseases called non-communicable, like rheumatism, rickets, and cancer, and even to minor maladies such as dental caries, oral sepsis, discharging ears, habitual constipation, the common but crippling cold, and the dyspepsias which cause so much chronic ill-health and lead to so much inefficiency. There is a move also towards investigating and dealing with worm infestations, which in the past have been somewhat neglected. Lastly, public education in hygiene has become a feature of the new campaign.

Innumerable Helpers.

Enough has been said to indicate that hygiene in this country must now be spelt with a very large H, and it must be evident that the health organisation is complicated, as indeed it could scarcely fail to be, considering its origin, the way it developed, the fact that, over a long period of years, there have been shifts and adaptations and modifications, the manner in which new legislation has been grafted upon old, the necessity for conforming to altered conditions of life. Some of the helpers have been mentioned, but there are many others. The school teacher inculcating simple rules of health helps the cause, so does the wise parent, so does the child who puts precepts into practice. The schools of medicine help and will help more when they adopt as the chief object of their training the permeation of the medical curriculum with the preventive idea. Specialist medical officers help, like those in charge of tuberculosis and venereal disease clinics. In this category comes also the school medical officer and, despite all that is urged against him and his doings, the public vaccinator. The medical practitioner helps and his help will increase in value when he coöperates to a greater extent than at present with the officers of the Public Health Service and if and when the

idea of periodical health examinations takes root. The medical press helps and it is gratifying to note how much attention it now pays to the preventive side of medicine. Veterinarians help by dealing with tuberculous milk cows and stamping out diseases of animals transmissible to man. Employers of labour help when they make provision for the welfare of their staffs and employees. The tradesman helps when by his cleanly methods he handles human food in a way to command respect and confidence. I always take my hat off to the maiden in the sweetstuff shop who uses a scoop instead of her hand, be the latter never so dainty.

Those engaged in research help as, for instance, the great army of workers under the aegis of the Medical Research Council and those engaged in many scientific institutions upon problems affecting every branch of hygiene. There are many voluntary agencies, like the League of Red Cross Societies, which help, some more wisely than others, but all in some degree so that we recall an old proverb of Portugal which says: "One grain fills not a sack but helps his fellow." The lay press helps often very greatly; occasionally, perhaps, not to the best advantage, but with opportunities vouchsafed to few of those who aid the cause. Its influence in the past has been widespread and in the future will become more effective when those best fitted to advise the public can make use of its columns for propaganda purposes. The Church helps in various ways and might help more if it recognised to a greater extent that sick bodies are specially apt to be tenanted by sick souls and that there is something to be said for giving bodily and mental hygiene a first innings in any attempt to elevate the masses and improve moral tone. The Law helps, though it is better not to invoke its aid and to try what persuasion and education can do in the first instance.

But the lesson to-day is that everyone can help. There is no mystery about the business. Once a few essential facts are mastered simple rules of health can be adopted and practised by any person of average intelligence. A vast deal of public health practice is common sense applied to every-day affairs. Long ago it was different. A pall of ignorance shrouded the medical faculty and the laity alike. Visitations of disease were supposed to be the outpoured vials of wrath of an outraged deity. Superstition was rampant. Fatalism held sway. The people perished for lack of knowledge. Now all is changed and, though we are still ignorant in certain directions, for example, the causes of influenza, measles, and the so-called "sleepy sickness" still elude us, we have a firm grasp of principles and in large measure are masters of our fate. Who can doubt it? Consider what has happened.

The death-rate of the whole country has fallen to a figure which 50 years ago would have been regarded by many as beyond the dreams of the most optimistic. The infantile mortality has been halved in the course of a generation, the tuberculosis death-rate has steadily declined; some diseases have become extinct, others nearly so. The expectation of life, that is, the number of years a person may expect to live from the time of birth, has greatly increased—i.e., from about 45 in 1900 to 55 to-day. In the U.S.A. it is 58, in New Zealand 62. In British India, a land where hygiene has as yet made little progress, it is only 23. What we now have to fight is not so much death as damage. Life has not only become safer but infinitely more confortable, though there is still great need for improvement.

Monetary Value of Human Life.

The facts are convincing but these kinds of facts do not always appeal to the multitude and, in any case, there are many people, who, quite rightly, always consider the cost, their motto being, "Is the game worth the candle?" and their candle meaning hard cash. Not only so, but perhaps because there was some truth in Napoleon's sneer about a nation of shopkeepers not a few folk in Great Britain and, I take it, the Isle of Man, want return for their outlay, if not actually in what used to be called "jingling Geordies," at least in *terms* of guineas or of pounds, shillings, and pence. Both classes may rest satisfied for it is well worth while spending money on health, which is in a high degree a purchasable product, and, moreover, hygiene pays. It is a good and sound investment both for the individual and for the nation. If any sceptics remain, they will naturally say, "Submit your proofs and in plain language which can be understood, not camouflaged by scientific verbiage nor rendered unintelligible by the use of what the Scotch call 'lang-nebbit' words." Well, here they are!—a few of them—there is not time for many though they could easily be multiplied.

First, let us consider the monetary value of human life. What is that enigma, a human being, worth in coin of the realm? Well, his or her value varies according to age. The latest calculations come from America and are, of course, not applicable to this country, especially as they are based on earning capacity. However, it is interesting to consider them. Dublin and Lotka have recently shown that in 1924 the potential value of a male child at birth was no less than £1866 and, what is more, they have demonstrated that since 1901 its value has increased by £356, or nearly 20 per cent., owing to improved conditions.

Woods and Metzger have shown that in 1927 the average per capita value of the population of the United States was £3113. There have been more or less vague guesses on the subject this side of the Atlantic and one feels that Dr. Nankivell, the medical officer of health of Plymouth, was distinctly cautious when he said: "It is not an exaggeration to suppose that a life is worth on an average at least £100 to the community." Working on this modest basis and comparing the Plymouth of to-day with that of 70 years ago, he concludes that the improved health of the city represents a large annual financial saving which for 1926 he estimates at £100,000. "Nothing," he says, "costs the individual ratepayer more than sickness and mortality."

There we have a calculation concerned with all kinds of preventable disease. Let us look at another limited to a single malady but a malady which takes heavy toll and which is one of the "Four Scourges" to which Dr. Fremantle devotes a chapter in his interesting book, "The Health of the Nation." The malady is syphilis, that "hidden hand in pathology," as it has been called, and Colonel Harrison, writing about it in England and Wales, points out that "in 1920 there were reported to the clinics about 42,000 cases. Of these probably 6000 would have died of some sequel of syphilis had it not been for the treatment afforded by the free clinics." He assumes that the value of a man's life is £60, which he admits is a very low figure considering that the deaths would have occurred in persons at the most productive period of life. As a matter of fact, £500 would have been nearer the mark, and, as we have seen, in the United States an infinitely larger figure would be quoted. However, if we put it at £60 the loss would have been £360,000 by 1927. This represents only the saving of life. The average patient prior to death is ill for about three years. Hence the system of free treatment, a great ally of hygiene, by which many thousands of people are prevented from becoming burdens on the community at a time of life when they should be national assets, must be of immense value to the nation.

Take another disease—small-pox—which in a mild form we now permit to run riot in certain parts of England. Dr. D. Rocyn-Jones, the county medical officer of Monmouthshire, estimated that the recent small-pox outbreak there had cost the rate-payers £10,000 in capital expenditure and equipment, while the maintenance of 200 beds for six months means another £13,000. That is a pretty state of things brought about by the neglect of a measure the value of which in preventing small-pox has been abundantly proved and proved up to the hilt.

Health and Industry.

Sickness in relation to its cost in industry formed the title of an interesting paper by G. F. McArthur, the chief lady welfare superintendent of the London Midland and Scottish Railway Company. She quotes statistics issued by the Ministry of Health to show that, in 1926, there were 15,000,000 cases of individual sickness drawing benefits under the National Health Insurance Act, and that 27,000,000 weeks of working time were lost owing to illness, much of it, remember, if not most of it, preventable. The loss of wages to the workers is estimated roughly at a minimum of £30,000,000 and this means a corresponding loss to the nation in spending power. There remains the loss to production faintly reflected, as she puts it, in the 27,000,000 weeks of lost working time. Approximate though they admittedly are, these figures are probably under than above the mark and they should give one furiously to think. It must be clear that money spent in diminishing this drain is money well spent, and, as a matter of fact, a comparatively small expenditure will bring about a great reward and in two directions. As McArthur well says: "If every industry would examine its sickness costs with the same thoroughness as it examines its manufacturing costs, and with the same motive of reduction, the result would not only be to bring down the premium of the health insurance societies but to bring 'peace in industry' many milestones nearer its longed-for fulfilment." Prof. E. L. Collis, quoted by Dr. Deardon, is even more emphatic on the "savings" question. He considers that medical science properly applied to British industry would result in an annual saving in labour turnover of from £60,000,000 to £70,000,000, in lost time of £50,000,000 to £60,000,000, in industrial convalescence of many millions more, and that to assess the total saving at £140,000,000 a a year would be quite reasonable and well within the range of possibilities. Lastly, for figures are apt to become wearisome, let me refer to an act of great significance. Insurance companies know the value of money and are careful about their investments. The American has never been accused of lack of appreciation of the dollar. Yet we find an American company, the Metropolitan Life Insurance,

generously supporting public health work in Canada and the United States. Why? Because it is good business.

There is another aspect to this financial question which strengthens the argument that hygienic measures pay. In the absence of adequate preventive measures employers of labour may have to compensate their workpeople. Not very long ago, the widow of a coal-miner in Scotland obtained compensation because it was shown that her husband had died of a disease called infectious jaundice and that he had become infected in the pit from a rat or rats harbouring the parasite of that disease.

Sound Investments.

With all these facts and figures before us what are the investments which can safely be recommended to the inhabitants of this island? From a study of statistics and from information kindly supplied, it is clear that antituberculosis gilt-edged stock, if it can be secured, would yield good returns. Well, it can be got if, at the same time, we take some ordinary temperance, I do not say teetotal, shares and secure also some housing debentures. I call these debentures because money put into good houses and devoted to lessening overcrowding may well result in a repayment of principal in addition to interest. Segregation cumulative preference shares may be commended. In other words, put money into an hospital where cases of communicable disease can be received and the danger of spread of infection thereby lessened. Little or no result may be seen in one year but the time will come when this investment will prove a boon and a blessing. Milk bonds are indicated, for there is much need for the consumption of more milk and such milk should be pure and cheap. Douglas has already put money into what we may call ordinary water shares with the ordinary result, which at one time would have been looked upon as extraordinary, that typhoid fever has been abolished in the town. It still, however, lingers in the other districts and so antityphoid stock is indicated for purchase. It is, as has been hinted, of different kinds. Finally, funds may well be devoted to obtaining education trustee securities, another gilt-edged stock. Making ourselves trustees for public health propaganda we can put money into this type of investment without being liable for depreciation. In any case, there should be no depreciation, nor should any of these ventures fail. The Isle of Man is favoured in many ways. It is comparatively isolated during part of the year, and isolation in health matters has its advantages. Its climate has much to commend it. It enjoys a fair measure of prosperity and yet is free from the graver industrial problems. It is interested economically in keeping healthy, for it derives much of its revenue from its visitors, and typhoid and tourists are incompatible. Its death-rate, 14·6 per 1000 in 1926, is a fairly respectable figure and is less than its birth-rate. Its infantile mortality-rate is not very high and is improving. Altogether it would appear as if the Isle of Man, starting, it is hoped, on a new race for health, has an excellent handicap. There really seems no reason why it should not achieve a record. It would be a proud boast in years to come if this little island could wrest the laurel wreath from another island, from New Zealand, which has already achieved several records and is all out to make others. It is worth trying, for everyone benefits in the process except perhaps undertakers, sextons, and the proprietors of cemeteries and crematoria, and, after all, these good folk can never be quite ruined, for all must, in the long run, die. The great thing, however, is to die as we are meant to die, peacefully at a good old age, and to live as we are meant to live, healthily with sound minds in sound bodies.

ASSESSMENT OF RATES ON HOSPITAL BUILDINGS.

A MEETING was held at Brighton on June 26th to consider the position of charitable bodies under the new assessment of rates in the borough brought about by the Rating and Valuation Act, 1925. Mr. A. F. Graves, who has for many years been connected with a number of Brighton institutions, expressed the opinion that the assessments which the corporation valuer had arrived at were far too high. The institutions had, since 1875, been assessed at nominal figures, but the valuer had now assessed them at what he considered to be their true value, and no one, except Parliament, could alter those arrangements. Unfortunately, Mr. Graves said, the corporation had brought the Act into operation earlier than any other corporation in England, and that made it extraordinarily difficult to ascertain how charities were being treated elsewhere.

Mr. Graves had attempted to ascertain the position of institutions in other towns of about the same size as Brighton. At Burnley the hospitals were not assessed at their full value; in Sheffield special consideration was given them, the assessment working out at £1 per bed. In Birmingham and Portsmouth the cases were dealt with on their merits; and in Leeds the institutions were not assessed at their full rack rental, some concession being made. Mr. Graves contrasted the case of the Sheffield hospitals, rated at £1 per bed, with the position of the Royal Alexandra Hospital for Sick Children at Brighton, the new assessment of which worked out at £14 per bed. Even London hospitals, occupying sites the rental value of which must be enormous, were only assessed at £4 per bed. Mr. Graves instanced three examples of the effect of the new assessment at Brighton. The Royal Sussex County, which formerly paid £100 a year, was faced with a demand for £1600 a year in rates; the Children's Hospital demand had jumped from £16 to £500; and the Eye Hospital had gone up to £100 from its former figure of £17. As to the Children's Hospital, the amount to be paid in rates would practically absorb the whole of its income from subscriptions. It was impossible for the hospitals to raise the extra money to meet the extra demand. If the position was not cleared, hospitals and institutions would not be able to build an addition to their buildings, because they would be rated on them at the higher rate.

A resolution was carried requesting the borough Members of Parliament to take steps to secure the passing of a short Act of Parliament, or such other measures, for relieving hospitals and other charities of the liability for paying rates under the assessments being placed on charitable institutions under the Rating and Valuation Act, 1925, and that the Town Council be requested to receive a deputation from that meeting to discuss the effect of the new assessments upon local charities.

A BRUTAL SCHOOLMASTER.[1]

AN English translation by Mr. Cyrus Brooks, of the well-known German novel, "Die Ursache," explains fully the popularity of the original and justifies the reputation of the author. The story is simple, terrible, and, which is not the case as a rule with terrible stories, perfectly coherent. A young poet and journalist, who has suffered greatly under a brutal schoolmaster, on visiting his old school, finds the pedagogue maltreating a pupil with similar callousness. Accordingly he kills him, on impulse, and attempts, in defending himself on the charge of murder, to explain the excellent social motives which had led to the crime. Unfortunately he had taken a bank-note belonging to the victim in order to make good his escape, and so comprehensible a reason for the crime neutralises a defence which otherwise might have been regarded as a plea of lunacy. One juryman only inclines towards leniency, recognising something of the murderer's mental state. In describing the last hours and execution of the wretched convict, no details are omitted that might add to the horror of the situation. As a study in psychiatry (perhaps) and as an example of the literature of the terrible (certainly) the book is worth reading. The point of view of the criminal is, presumably, that his crime was justified, or had followed necessarily upon the resuscitated experiences of childhood; the jury only saw in it an ordinary case of theft with murderous violence. The verdict of an ordinary jury was inevitable, even though the mentality of the poet was misunderstood; a jury of psychologists might have been willing to substitute life-long confinement for the death sentence.

HOSPITALS FOR MIDDLE CLASSES: AN APPEAL.

AT the recent conference of the British Hospitals Association, Sir Thomas Horder referred to the need for some alternative to the private nursing home for patients of limited means. The administrator of St. Andrew's Hospital, Dollis Hill, Mr. W. E. Carton de Wiart, points out to us that a beginning in this direction was made as far back as 1913, when the institution over which he watches was opened for the reception of patients, who, while not suitable subjects for free treatment in charitable institutions, were yet unable to meet the charges necessary to secure adequate medical or surgical treatment in private nursing homes. This institution, which depends for its maintenance upon voluntary contributions and patients' payments, stands in its own grounds of 17 acres and is equipped with all modern requirements, while patients are admitted only on the recommendation of their medical adviser; there are no restrictions either as to nationality or creed. As the hospital is now well known, its accommodation of 52 beds is, of course, taxed beyond its limits, and there is urgent need for increasing the number of beds, and for the provision of a children's ward. The domestic provision for the staff, already inadequate, would become more so as a result of the enlargements. The improvements urgently needed are estimated to cost £30,000, and towards this sum £6600 are already available, and builders' plans have been prepared. If the necessary financial help were forthcoming, extension operations could proceed at once. Full particulars will be supplied on application to the Administrator, who makes out a good case for prompt assistance.

[1] The Cause of the Crime, by Leonhard Frank. London: Peter Davies, Ltd. 1928. Pp. 188. 6*s*.